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With telecommuting becoming so popular and the technology that enables it becoming more advanced, is geography still important to innovation of the firm? Geography, along with satisfaction and telecommuting as a lifestyle choice, will be examined in this study. Telecommuters often report both positive and negative effects of telecommuting. When the two are weighed together, are telecommuters more satisfied than dissatisfied? Primary data from a survey administered to 500 telecommuters and 500 traditional employees of a Fortune 500 firm are used to answer these questions. With construct validity, using cross tabulation with a chi-square value as an indicator, this study finds that telecommuters are satisfied despite negative effects of telecommuting and having physical ties to the office is not dependent on satisfaction. It is also determined through executive interviews and chi-square values of certain constructs that telecommuting is indeed a lifestyle choice. Although geography is still deemed important, this will likely change in the future as more people entering the workplace are accustomed to less face-to-face interaction.

TELECOMMUTING SATISFACTION, LIFESTYLE CHOICE AND GEOGRAPHY:

EVIDENCE FROM A FORTUNE 500 FIRM

By

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_____
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To Randy Spratt, your kindness and generosity will be remembered.

To Jens and Sailor, thank you for your support.

APPROVAL PAGE

This thesis has been approved by the following committee of The Graduate School of The University of North Carolina at Greensboro:

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CHAPTER I

INTRODUCTION

The term telecommuting[1] was first used by Jack Nilles et al. in a report from the University of Southern California and the National Science Foundation (Nilles et al, 1974). Since then, there has been abundant research to understand the impacts on the future of telecommuting. In particular, job satisfaction of telecommuters is highly implicative according to the number of days one telecommutes per week, duration of telecommuting episodes, and frequency. Hartman, Stoner and Arora (1991) examined managerial attitudes along with technical and emotional support as related to telecommuter satisfaction and productivity. Bélanger (1998) used questions regarding the work environment as a basis to measure job satisfaction. The minimum or maximum days allowed, or required, to telecommute also affects job satisfaction, as Bernardino (1996) found. Questions still remain whether telecommuters are really satisfied, considering both the positive and negative effects of telecommuting. Are telecommuters satisfied with their way of working despite negative effects of telecommuting, and is telecommuting more of a lifestyle choice than it is a career choice?

[1] Merriam-Webster defines telecommute as "to work at home by the use of an electronic linkup with a central office (www.m-w.com, 1/14/2007)."

Despite all of this debate, several factors in the last ten years drastically changed the dynamics of telecommuting, especially within the firm. Costs for computer production and ownership dropped, making it more affordable for firms to upgrade computer systems, and for people to own personal computers at home. Figures from the Bureau of Labor Statistics show that the producer price index[2] for portable computers, laptops, PDAs, and other single user computers, fell from 1243.4 in 1997 to 81.9 in 2006 (BLS, 2007). Respectively, the producer price index for wireless and communications equipment manufacturing fell from 105.7 in 1997 to 92.6 in 2006, with the most significant decrease happening after 2001 (BLS, 2006). The affordability of goods and services related to telecommuting, and the creation of user-friendly collaboration tools for remote workers, along with an increase in knowledge workers, allows both firms and employees to adopt telecommuting more extensively than ten years ago. Evidence of this lies in the increasing amount of firms with formal telecommuting policies in place. The number of Americans whose employer allows them to work remotely at least one day per month increased 63 percent, from 7.6 million in 2004 to 12.4 million in 2006, according to a recent report issued by WorldatWork (ITAC, 2007).

Telecommuting has made a transition from being a nice-to-have to being a must-have work arrangement, for both employees and employers alike. A 2006

[2] The producer price index measures the average change over time of the selling prices received for domestic goods and services (BLS, 2007)

Yoh[3] survey of 198 HR managers at the Society of Human Resource Management Conference found that 81% of hiring managers have policies that allow employees to work remotely (Business Wire, 2006). The latest Telework Conference in 2006 reports that 68.5 % of the American population uses the Internet, 36% have high-speed connections and 26 million are telecommuters (Telework, 2007). Although the actual number of telecommuters can vary widely as demonstrated by Mokhtarian, Salomon, and Choo (2005), the culmination of these factors leads to the conclusion that telecommuting has reached a critical mass (Business Wire, 2006).

Overall, an emergence of the following factors warrants a closer look at the technologically modern firm: advanced information and communication technologies that have increased productivity by means of faster and larger data transmission through higher bandwidth; transition to high-speed cable internet, prices consumers pay for technology have dropped making ownership of PCs, laptops and PDAs widely affordable; the culture of free wireless internet as seen in coffee houses, city parks and main streets. Most recently, Macedonia in Southeastern Europe advertised itself as the first Wi-Fi country (The Economist, 2007). All of these factors have forged a new perspective on the mobility of work, which warrants further consideration of the geography of telecommuting within the firm.

[3] Yoh is a talent and outsourcing services company and business unit of Day & Zimmerman

With an increase in communication and collaboration tools, such as those enabled by Web 2.0, telecommuters today have many possibilities to communicate and disseminate information with the company office and other remote team members and colleagues. Wilson (2007) describes Web 2.0 as *second-generation* Internet services that facilitate social networking, online collaboration, wikis, podcasts, blogging and content tagging. This technology should not only be able to somewhat ameliorate negative effects of telecommuting, such as, feelings of alienation and not being able to share ideas and concerns, but it may also lessen the importance between the innovation of the firm and geography as more and more people entering the workforce are accustomed to online networking and collaboration tools, both privately and in the workplace. In particular, work-wikis[4] act as a surrogate for team collaboration, allowing multiple members of a virtual team to contribute simultaneously. Work-wikis allow all team members to equally express their opinions, or be heard, where group or team interaction in a face-to-face situation can suppress such openness due to group dynamics or time. Face-to-face interaction and remote collaboration tools both have their own advantages and disadvantages.

With more and more employees telecommuting, and with years of debate and research on the topic, this thesis investigates how the modern, technologically savvy firm utilizes telecommuting as a locational advantage and

[4] Work-wikis are Web sites that enable users to easily edit and update shared content (Gibson, 2006).

answers questions on satisfaction and lifestyle choice. Since many telecommuters are information workers[5] in knowledge economy[6], this piece of the puzzle is important for telecommuting in relation to firm innovation and geography. With the spread and ease of telecommuting, along with technological advances and better tools for collaboration, is the importance of geography waning in relation to innovation of the firm?

Research Objectives

This study utilizes primary data from a survey administered to a sample of telecommuters and a sample of traditional employees in order to measure telecommuter satisfaction, and determines if telecommuting is more of a lifestyle choice compared to a career choice. Participants in this survey include a randomly selected group of telecommuters and a randomly selected group of traditional employees from the same firm. The second part of this study is an email interview of executives and managers of firms who were not able to participate in the survey. These interviews are used to gauge the importance of firm innovation and geography as related to telecommuting. The purpose of this study is to investigate what is happening in respect to telecommuting when technology dependencies are high, as more firms are dependent on up-to-date technology, and location dependencies are low, allowing business to take place most anywhere.

[5] Individuals whose primary economic activity involves the creation, processing, manipulation or distribution of information (Handy & Mokhtarian, 1996)

[6] An economy in which the production factors-labor and capital-are aimed at the development and application of new technologies (Raspe & Van Oort, 2006)

As telecommuting becomes more popular with firms seeking to increase employee retention and flexibility, more research is needed at the corporate level to determine the effects of telecommuting on employee satisfaction. Several researchers (Ellen & Hempstead, 2002) concluded that telecommuting will be carried out on a more part-time basis or will not be formalized extensively within the firm (Baily & Kurland, 2002). Due to ever changing technologies as discussed earlier, I believe this may be an understatement of what is happening in the workplace. The major contribution of this study is that it captures telecommuting in a higher technological state than it was ten, or even five, years ago utilizing a unique data set to answer the research objectives.

Although this study will examine and compare job satisfaction of telecommuters and traditional employees, it will also lend itself as a good comparison to similar studies of city and state (public) agencies and will also show how telecommuting has changed the dynamic of the modern firm. It is important to look at how telecommuting is being used as a location advantage and how widely it is utilized and supported within the firm. What isn't really known yet is how the firm has changed due to telecommuting; in particular how knowledge and innovation are affected. If firms rely heavily on telecommuters as a significant portion of their workforce, then there are many considerations as to what extent such a work arrangement will have on organizational culture, knowledge transfer and organizational learning. Aside from gauging satisfaction and the question of lifestyle choice, this study will also contemplate the confines

of knowledge, innovation and geography as related to telecommuting. With telecommuting becoming so popular and the technology that enables it becoming more advanced, is geography still important to innovation of the firm?

CHAPTER II

LITERATURE REVIEW

Telecommuting has enjoyed much revelry by those that engage in it and it has a solid representation in academic journals and the popular press alike. Research, reports and findings of increased employee satisfaction, productivity gains, location choices of telecommuters, and variable definitions of a telecommuter, have all shed light on the multi-faceted context in which telecommuting is involved.

Some research has been solely dedicated to defining telecommuting and its sundry variations (Mokhtarian, 1991). An overview is necessary to gain a perspective on previous research and issues with terminology that may arise.

Definition of a Telecommuter

Telecommuting is often used interchangeably with its close relatives: the remote worker, the virtual worker, the off-site employee or teleworker. Even though the relationships here are turbid, and very close, least discernable is that between telecommuter and teleworker. The miscibility of the two terms may confuse readers due to variation in usage, and should be well defined for the purpose in which either is being used. Jack Nilles (1991) defines teleworking as "…the substitution of telecommunications technology for work-related travel. Telecommuting, a subset of teleworking is the partial or total substitution of

telecommunications or computer technology for the daily commute to and from work." The difference may seem subtle, but telecommuting has a more specific definition with the emphasis being on the commute, while teleworking emphasizes where the work is done. Both are being enabled by telecommunications technology. In his 1998 book, *Managing Telework*, Nilles further clarifies the difference between teleworking and telecommuting.

> The term telework refers to a growing array of alternative work styles that involve substituting telecommunications for what was formerly done via travel – or was not possible at all. Telecommuting… emphasizes that major portion of telework that acts to reduce or eliminate that stressful daily commute to work (Nilles, 1998).

A practical example of teleworking is a home-based business where one person manages a consulting business without performing work for a client, but uses telecommunications technology to administer the business in the home. If work is performed for clients in the home, using computer-based technology where the work is paid for and managed by the client that would be telecommuting.

Mokhtarian, Salomon and Choo (2005) regard "telecommuting as a subset of teleworking, where salaried employees of an organization replace or modify the commute by working at home or a location closer to home than the regular workplace, generally using ICT…." This definition may be restrictive for several reasons, but is appropriate for measuring commute reduction as intended. The authors don't consider after-hours work to be telecommuting, either. Granted the

authors are only concerned with the arduous task of determining how many telecommuters exist, and in the context of the literature this restriction is more of a means by which telecommuters are possibly counted. For general purposes, employees that work after-hours or overtime at home or at a telecommuting location, where connecting to the network is necessary to do the work, then this excludes possible telecommuting episodes. What is the difference between a full-time telecommuter who does not have any office space at the company location or physical ties to the office and a traditional employee who does not "officially" telecommute, but both are performing work after their regular business hours that requires logging in to the company network? With employees being able to login to the company network two of the authors requirements, being organizational employees and using ICT to substitute a commute, are met and should be considered. First, if the work does require logging in to the network, then without this connection a commute to the office would be needed to perform the work, thereby eliminating or reducing the commute. Mokhtarian, Salomon and Choo (2005) recognize the substitution of a commute for working at home as a reason for counting work done as telecommuting; however, access to the company network from home was not specifically addressed. With more firms allowing all employees to connect to the network remotely or from home, and not just telecommuters, this kind of change in the firm and its affect on telecommuting should be recognized.

Secondly, Mokhtarian, Salomon and Choo (2005) mention that in measuring the number of telecommuters a formal arrangement with the employer is likely criteria used, but may undercount those telecommuting that have no formal arrangement. With more firms allowing, both telecommuters and traditional employees to connect to the company network remotely, then this kind of setup implies that the employee will be working outside of regular business hours and remotely, and therefore, may be considered as a formal arrangement. Although it is not known how many employers allow remote network access or how prevalent it is within firms, this indicates the need for more research and a careful look at the possibility of telecommuting being more widely utilized than previously thought. When both telecommuters and traditional employees have access to the company network from home or via their laptop from other remote locations, then this should count as a formal arrangement since this kind of setup is implies working outside of the regular workplace, and perhaps after hours, too.

It may also be that a telecommuter works from a telecenter that is not closer to their home than the company location. Although working from a telecenter would typically be considered telecommuting, the authors stress that a reduction in commute needs to be a defining factor in counting the number of telecommuters. If an employee is forced to work from a telecenter that is farther from their home than the company office, perhaps due to lack of office space or because they are mobile workers serving clients, then this is also worth counting because vehicle miles traveled are increased and not decreased, as would be

expected with telecommuters. It is equally important to consider all telecommuting situations to find out what progress is made or needs to be made in reducing vehicle miles traveled. By not counting them we are missing an opportunity to examine and account for related issues that detract from the goal of reducing vehicle miles.

Telecommuting is often being defined in a piecemeal fashion based on the intent of its use. Hartman, Stoner and Arora (1991) offer a methodological approach with corporate underpinnings.

> First, telecommuters must be organizational employees. Second, they must regularly work at home or a remote site one or more days a week. The utilization of this restrictive telecommuting definition is consistent with the way most organizations define telecommuting (Hartman, Stoner & Arora, 1991).

It is hard to determine if that is how most organizations define telecommuting without available information on organizational telecommuting programs. Hartman, Stoner and Arora (1991) give a mention to the interpretation of organizational telecommuting arrangements, which is very important since this is something that can vary from firm to firm. In speaking with only a handful of firms in order to elicit participation in this study, most firms had either a well defined telecommuting program or had formal arrangements, where the primary workplace of the telecommuter was not at the company location. This could indicate a change in the adaptation of telecommuting and a higher frequency of

telecommuting days in the firm, and indicate a higher amount of mobility for some employees.

Another workable definition is that a teleworker (telecommuter) is one that works outside the conventional workplace, using telecommunications or computer based technology (Baily & Kurland, 2002; Nilles, 1994; Olson & Primps, 1984). This definition does not consider frequency or commute, and assumes that the terms telecommuting and teleworking are mutually alternative.

An executive vice president of a large Fortune 100 firm asked me in an email if working on a laptop while in an airplane would be considered telecommuting. Based on the definition given above, it certainly would. In my reply I took it one step further and asserted that he is not only telecommuting, but also rather *hypertelecommuting* since he was working while at speed or in transit. Even though this was done jokingly, it made me think about those classes of workers who are truly mobile and happen to work while in transit, such as this executive. The variance of definitions of what is telecommuting can just about tolerate any such work situation. With the mobility that accompanies a certain class of workers, such as executives or those in sales, work can and does happen most anywhere. For some employees, telecommuter or traditional, working on trains, planes or buses is a common occurrence. One may argue that a reduced commute does not play a role, but using a commute reduction as a defining variable of telecommuting is more prevalent with transportation studies than it is with organizational studies of similar research.

Due to weekly conference calls in different time zones, one former colleague of mine told me he had a choice of either staying at work later for the conference calls or he could dial in on his mobile phone during his bus ride home. Working while in transit or during the commute can be practiced by traditional employees, but may also be heavily utilized by those that are truly mobile workers where there is no company office to speak of. I will leave this conundrum for my peers to decide.

With Mokhtarian's (1991) research dedicated to defining telecommuting, criteria are assembled based on management of telecommuters and commute reduction. To differentiate between a telecommuter and remote worker Mokhtarian (1991) offers that remote work is done by an individual while at a different location than the persons directly supervising or paying for it, and that for it to count as telecommuting remote management needs to be a factor, as does a reduced commute. The Telecommuting Advisory Council based in Los Angeles, CA recommends that the definition be broad enough to include alternate locations while emphasizing reduced commute for the purpose of emphasizing air quality (Mokhtarian, 1991). By adding remote management of telecommuters as a part of the definition, it strengthens the difference between telecommuter, teleworker and remote worker. What about employees who manage remotely? Many executives or senior-level managers are highly mobile and often work in remote locations. If the only difference is that they are managing employees instead of being managed, then occasions where remote

work is done using technology to communicate with the office should count as telecommuting. With this study, the mobility of telecommuters is an important factor since technology has become so important as an enabler of telecommuting.

To understand the differences in the definition of telecommuting one need only look at where the study is coming from and what purpose it may have. Studies that are concerned with a reduction of commute miles, or the affects on location choices of a mobile workforce, should incorporate focus on commute reduction in the definition (Mokhtarian & Bagley, 2000; Ory & Mokhtarian, 2005). The location of telecommuters will be important in determining the effect on the reduction or increase in vehicle miles traveled, and any factors that may affect the spatial environment. The use of technology in any form is also a defining factor. Are employees telecommuting if work done at the remote location does not involve the use of technology? This would be typical of some employees that take work home with them, but do not *connect* to the office with any type of technology (Mokhtarian, 1991). Telecommuting is the term that is most likely to be used if you are accentuating a reduced commute, particularly with transportation scholars. Telework is more likely to be used by organizational, technology or management scholars, and is commonly used in studies abroad, but is inclusive of telecommuting.

For the purpose of this study a telecommuter is one that is an organizational employee who uses ICT to communicate with the office from a

remote location, where remote management or managing remotely is present. Overtime work done at home or remotely, is counted as telecommuting if it does ameliorate a commute to the office or if connecting to the company network is required to perform the work.

Job Satisfaction of Telecommuters

Previous research covers many aspects of telecommuting, from motivation to telecommute, frequency and duration of telecommuting, attitudes of telecommuters and their managers, travel habits and job satisfaction. Satisfaction can be defined as a worker responding positively to his or her job and job-related experience (Bélanger, 1999; Chapman et al., 1995). Baily and Kurland (2002) claim that there is little evidence of increased job satisfaction among telecommuters since most studies have examined satisfaction with telecommuting and not general job satisfaction. The authors refer to studies by Bélanger (1999), Norman et *al*. (1995) and a few others that have measured job satisfaction. It would be ill contrived to think that any employee only had positive feelings to report about his or her job. If we can take both positive and negative feelings about telecommuting and find out where the scale tips, then an accurate assessment about job satisfaction of telecommuters will be possible.

In the study by Bélanger (1999), *work environment* is the defining terminology in all questioning of job satisfaction. These questions can be used for both telecommuters and traditional employees to measure satisfaction of both groups; however, only offers satisfaction as mostly being reconciled by external

controls and revolves around ties to the physical office and the work environment instead of the actual job or work committed. Norman et al. (1995) use a line of questioning created for measuring job satisfaction of blue-collar workers. Certainly questions as these can elicit positive or negative feelings, but may not represent the differences in satisfaction of working in the office compared to working remotely. In any study the proper fit of questioning to telecommuter satisfaction is somewhat subjective simply because each telecommuting situation can be different and may depend on frequency, duration and the uniqueness of the telecommuting situation. In this survey not all respondents had coworkers or belonged to an office team, for example. Telecommuters can have more spontaneous work arrangements and associate themselves more with clients outside of the firm than with a typical office team. Advances in technology have propelled this situation even more. With today's telecommuters the use of technology is implicit, and primary data from a survey is an appropriate measure to capture this.

Salomon (1998) refers to telecommuting as "…an ideal form of technology." When considering telecommuting this way, the difference between telecommuters and traditional employees and the utilization of technology as a component of job satisfaction, then the divide gets too large for a mutual comparison. Targeting general job satisfaction of telecommuters can be a recondite task when using similar controls that measure satisfaction of traditional employees. In Solomon's (1998) view, telecommuting is a social change- an

application that modifies the social institutions of work and home. Two people may be performing the same task, one at home and one in the office, and using the same technology to do it; however, the lines are less defined for telecommuters.

Baily and Kurland (2002) create a strong compendium of survey research on telecommuting and address the main issues in each survey by looking at the foundations supporting these surveys. The authors attest that there is little evidence of *general* job satisfaction but more directly satisfaction with telecommuting. In respect to previous research or surveys on telecommuting, it is hard to separate the act of telecommuting from the general job. This also holds true for traditional employees. Telecommuting is the raison d'etre for many of these studies and separating the function of the job from where, how and when the work is committed will be difficult. However, using construct validity and a strongly associated control group, it is possible to come closer to assessing job satisfaction with telecommuting.

If any study measures positive feelings that telecommuters have about the workplace, then almost any of these could pass as job satisfaction based on the definition provided by Bélanger (1999) and Chapman et al. (1995). Bélanger (1999) also cited research that telecommuters who were forced to telecommute may feel more dissatisfaction. Since some of these studies took place when telecommunications were not as advanced as they are today, then inferior technology could be one reason for dissatisfaction.

Hartman, Stoner and Arora (1991) surveyed 97 telecommuters from 11 different firms. The purpose of this survey was to examine the relationship of specific variables on satisfaction with telecommuting and productivity. Although the authors do not specify how many days per week the sample telecommuted from home, they do know that 20 hours per week were spent telecommuting. The average number of hours worked per week by the group was 40 hours, with 69% reporting that they have telecommuted for 2 years or less and 34% for one year or less. Hartman, Stoner and Arora (1991) found that satisfaction with telecommuting had a strong correlation with technical and emotional support received by the supervisor.

One study of state employees in North Rhine Westphalia in Germany found that satisfaction either remained the same or increased after an alternating telecommuting schedule was introduced for a 6-month period (Buddendick, Leo & Hell, 1999). Participants were required to work two-fifths of their time in the office and the remaining time telecommuting from home. The majority of satisfaction reported was due to flexibility of the work arrangement at home. In the exit interview, participants also reported enjoying saving 2-4 hours of commute time.

Negative Effects of Telecommuting

In a paper devoted to previous telework research and findings, Baily and Kurland (2002) make several observations about the degree of specialization of previous research and generalizations about the properties of telecommuters.

The authors state that telecommuters in many of the previous studies do not telecommute on a full-time basis; therefore, they are likely not identified as telecommuters by the organization. They report that effects on social isolation from the office are not very insightful in this respect. Also noted by the authors is that telecommuters often work as contractors, and are consequently hard to count or estimate nationwide. Many of the previous studies do deal with infrequent and short durations of telecommuting, which affect the severity of the negative effects of telecommuting.

Isolation was found to have an impact on professional development regardless of being a public or private organizational employee (Cooper & Kurland, 2002). Informal learning and mentoring were found to be more problematic for telecommuters from private organizations due to the amount of team interaction required or the higher frequency of telecommuting that takes place in private organizations compared to public organizations (Cooper & Kurland, 2002).

Telecommuters often cite the lack of understanding or training of traditional employees that telecommuting is a viable, productive way to work. In their evaluation of a six-month telecommuting program in the state of North Rhine Westphalia, Buddendick, Leo and Hell (1997) found that telecommuters often received comments on their days in the office about how they could be lazy all day at home and not work on their telecommuting days, despite reports of increased productivity from managers. Poor understanding of a telecommuter's

work situation at home can possibly elicit more work from telecommuters if they feel they are being closely scrutinized, and lead to higher productivity (Buddendick, Leo & Hell, 1997). If telecommuters are full-time and don't report to an office at all, then they may receive such admonitions via electronic communications or by phone, but may not experience it face-to face.

Productivity

Along with increased satisfaction of telecommuters come reports of increased productivity. Productivity is almost constantly exalted by telecommuters and their managers as having increased when an employee starts telecommuting. What is behind this phenomena and what considerations need to be made when evaluating productivity? Productivity can be measured in several ways. The most widely method of measuring productivity of telecommuters is by output, with telecommuters producing more than traditional employees, which can be difficult, if not impossible to quantify in most cases. This is usually represented by managerial responses in surveys and interviews. Another method in which productivity of telecommuters is reported is through a gain in value-added[7] through a reduction in office space or bottom-line spending per employee by the firm. It costs far more to set up an employee in an office compared to the cost of setting the employee up in a telecommuting situation at home (Kopf, 2000).

[7] Value-added refers to the additional value created at a particular stage of production or through image and marketing. In modern neoclassical economics, especially in macroeconomics, it refers to the contribution of the factors of production, i.e., land, labor, and capital goods, to raising the value of a product and corresponds to the incomes received by the owners of these factors. (www.wikipedia.org, 2007)

In a study by the Massachusetts Telecommuting Initiative, 300 respondents from 50 employers provided insight about organizational and operational issues facing telecommuters, supervisors and non-telecommuting coworkers (MDOER, 1994). A total of 87 % of telecommuters report an improvement in worker productivity; a similar percentage, 82.6, was reported in a phone interview the following year (MDOER, 1994). Supervisors (96.7%) reported an overall improved performance for telecommuters (MDOER, 1994). A survey of 1000 telecommuters worldwide put out by Sonicwall, a network firm, reported that despite some taking naps or watching TV, 75% are more productive at home than in the office; and 12% of men and 7% of women reported wearing no clothes at all (www.tagesschau.de, 2006).

Johnson (2004) estimates that it costs between $10,000 and $20,000 per year to provide office space for an employee in a major metropolitan area, and between $6,000 and $10,000 in a smaller city. Although Johnson reports that employee retention is increased and knowledge is maintained, knowledge may also become static and not codified- there is no financial estimate on this kind of externality. With reductions in real estate costs and support personnel, and an extended geographical reach, employers can possibly save $441 billion due to reduced absenteeism and recruiting costs, plus increased productivity (Kopf, 2000).

Westfall (2004) articulates that although reports of productivity are fast and plentiful, there is very little quantitative support to this assertion. Baily and

Kurland (2002) criticize self-report data of telecommuters on productivity, however it should not be overlooked that managers also report higher productivity from their telecommuters compared to their traditional employees. Buddendick, Leo and Hell (1999) found in their survey of an alternating teleworking schedule that 37.5% of the managers reported being satisfied with telecommuter productivity, while 12.5 % were not. Not all reports of increased productivity are quantifiable and must rely on measures such as surveys or interviews. Managers that set timelines for work assignments and utilize Six-Sigma[8] principles to measure productivity for telecommuters in the service sector should give more credibility to reports of increased telecommuter productivity, if used as a basis for declaring telecommuters are more productive. On specific team or project settings in private organizations, Six-Sigma can be a strong indicator of telecommuter productivity where outcomes are quantifiable. Specifically, meeting timelines, staying under budget and fulfilling all requirements of the project, are all means by which productivity can be measured.

In concluding on this section, I believe that satisfaction with telecommuting is as good as general job satisfaction, if not more important. Unlike the traditional office, telecommuting is a triad that affects the home life, work life and

[8] Six Sigma is a business improvement methodology that focuses an organization on: Understanding and managing customer requirements; Aligning key business processes to achieve those requirements; Utilizing rigorous data analysis to minimize variation in those processes, Driving rapid and sustainable improvement to business processes. (www.motorola.com, 2007)

family life, where all three are intermingled. What about employees that have the ability to login to the company network from home but are not designated as telecommuters by the organization? They may quietly be subverted by the affects of possible telecommuting situations without the same benefits designated telecommuters receive. I feel the location and the technology that enables the work situation should be the defining principles of satisfaction with telecommuters. According to the definition of satisfaction as given by Bélanger (1999), any reports of positive feelings about the job can be considered as satisfaction, and would include studies that measure general job satisfaction, too. This study will examine the outcome when positive and negative aspects of telecommuting are reconciled and will focus on physical ties to the office as a determinant of satisfaction with telecommuting.

Location and Spatial Effects of Telecommuting

Several researchers have looked at telecommuting and its affect on the spatial environment. Of interest is whether telecommuting contributes to urban sprawl and if the ability to telecommute causes one to relocate their residence further away from the regular office. In his study on telecommuting and urban sprawl, Jack Nilles (1991) found that telecommuting results in decreased automobile use in the number of trips driven and distance. He further concluded that *telesprawl* might become a possibility depending on the future growth levels of regional centers (Nilles, 1991).

Ellen and Hempstead (2002) examined data from the 1997 Current Population Study to determine if telecommuters were living in more rural or urban areas. The authors believe that based on previous research people are likely to telecommute only part-time and for limited periods, and therefore, telecommuting will have a minimal effect on residential choices (Ellen & Hempstead, 2002). The conclusion of this study was that there was no evidence to support that telecommuting has a decentralizing effect on residential location. Perhaps the same study of current data may produce different results due to the availability of high-speed Internet in more rural areas than when this study took place.

Ory and Mokhtarian (2005[a]) analyzed telecommuter survey data on workers of the State of California that was gathered from 1988 to 1998, and found that telecommuting had a positive impact on residential location; meaning telecommuting followed a relocation rather than preceding it. Even though the authors note that the differences between the study groups were insignificant due to small sample size and large variances, the study showed that telecommuters moved closer to their place of work. Ory and Mokhtarian found that decentralization was occurring independent of telecommuting (2005[a]).

When looking at telecommuting studies or surveys of public organizations, such as, state and city workers (Ory & Mokharian, 2005[a]; Ory & Mokhtarian 2005; Bagley & Mokhtarian, 1997; Varma et al., (1998); Mokhtarian & Bagley, 2000), the differences between public and private employers must be acknowledged. Such studies are great in that they can provide a good measure

and implications for other cities, states or government agencies aspiring to start telecommuting programs, and they can appeal to a huge constituency across the nation. These studies of public sector telecommuting may also be a good measure for private sector firms with the same geographical limitations. However, certain geographic and contextual constraints potentially make these studies limited in a broad applicability to firms. Unlike cities or states, firms may not be likely to have the same geographical limitations and are more susceptible to the outside influence of a global economy. The competitive nature of work is more present in firms, where government employees may enjoy more job security.

In their interview study of a group of private sector and public sector telecommuters regarding professional isolation, Cooper and Kurland (2002) note that in general, the public sector tends to have a more hierarchical structure and the perceived relationship between job promotion and performance is weaker than that of the private sector. In this respect, much consideration needs to be given to findings of studies and surveys that use public sector organizations as the foci. City and state agencies aren't being chased by *creative destruction*[9] as firms are. Similarly, certain job functions may require a regular physical presence that could limit telecommuting frequency. Job categories of both telecommuters and non-telecommuters in the study by Cooper and Kurland (2002) included environmental review specialists, civil engineers, chemists,

[9] Joseph Schumpeter – Capitalism is and never can be stationary, and is evolutionary. (ch.VII, The Process of Creative destruction)

support service staff, planners and data systems coordinators and technicians. Job function that limits telecommuting could be true for any organization that offers telecommuting, but may factor more in public organizations.

What dependencies on location may affect the ability and frequency of telecommuting? Most states or cities require that you at least live in the state to even be considered for employment. As discussed earlier, jobs in public agencies may require more of a physical presence in the office than those in the private sector due to the public's need of accountability and access to data and public employees. Work relationships for telecommuting public sector employees may be restricted to a localized area, as well.

One look at data from the Bureau of Labor Statistics (2006) will show that Americans are highly mobile and transient when it comes to job tenure and residential relocation. Even though the data are based on the whole population, telecommuters are also a part of that population. It is difficult to challenge job tenure or duration of telecommuters and residential mobility without careful questioning. In January 2006 the median years that salary and wageworkers had been with their current employer was 4.0 years, which is unchanged from 2004 (BLS, 2006). In 1993 the median length of time people lived in their current residence was 5.2 years (Hansen, 1998). If you compare residential mobility over time with that of innovations in technology (e.g. home PC, email, laptops, microprocessor capacity and size, bandwidth in data transmission) over the last 20 years, certainly there may be a relationship with telecommuting and

decentralization; however, it is hard to say that it is because of telecommuting and not the technology that enables it. Decentralization has already been occurring as firms sought lower rent (Sohn, Kim & Hewings, 2002).

If telecommuters are living where they are working, then they are essentially helping balance jobs and housing on an individual level. However, when people have to relocate with jobs, with the inability to telecommute, then this has the potential to contribute to urban sprawl for those needing affordable housing. A study by Ellen and Hempstead (2002) based on data from the 1991 Current Population Survey, found no decentralization of telecommuting from urban to rural areas. This study was not able to tell whether telecommuters lived further from their workplace, but was able to see if telecommuters lived in more rural or urban areas. This same study may yield a different result with more recent data since technology has advanced so much since then, mainly due to the spread of high-speed Internet access to rural areas.

Sohn, Kim and Hewings (2002) cite evidence from research on information technology (IT) and urban spatial structure that information and communication technology (ICT) is a way to overcome the costs of spatial separation. Furthermore, technology leads to a dispersion of urban activities, rendering geography immaterial (Sohn, Kim, & Hewings, 2002; Gordon & Richardson, 1997). Salomon (1985) concluded that the effects of telecommunications on travel would likely have neutral impacts on one another due to the need for face-to-face interactions and stressed the human desire to be

mobile. This assessment on telecommunications and travel has a timeless appeal to it, even with the advanced ICT we presently use.

One survey administered by Techies.com, a website for technology professionals and employers, reported that telecommuting had yet to gain much traction and that out of 1,953 that responded to the survey, only 9% were fulltime telecommuters (Anderson, 2001). The number one reason people gave for wanting to telecommute was to avoid a long commute (Anderson, 2001). Previous studies (Ellen & Hempstead, 2002; Mokhtarian & Salomon, 1997; Stanek & Mokhtarian, 1998) sited no link that commute reduction was a reason for wanting to telecommute. This alludes to a problem in motivations for telecommuting. For those that want to telecommute, reducing a commute is the prime motivation. For those that are already telecommuting, as the above studies found, reducing a commute is not the primary motivation for doing so. This could indicate a spatial mismatch in the supply and demand of telecommuting available in congested areas or that those already telecommuting were satisfied with their location or commute distance, or it was not a factor in their reason for telecommuting in the first place. It may be that the situation that resulted in an employee telecommuting may be different than that of the traditional employee. If some telecommuters are hired as such, without having a commute to the office to begin with, then naturally, reducing a commute will not factor in the reasoning and they may possibly be located so far from the company location that a commute to the office is not required.

In this study some attention will be given to traditional employees and their reasons for wanting to telecommute.

Geography and Innovation of the Firm

Innovation and geography should not be considered as stationary for any firm. The ability to bridge both is an imperious task for the firm. Even as I sit writing this paper in an airport executive lounge, my quest of synchronizing these ingredients has been all over the map: from the Green Bean in downtown Greensboro to Harris Teeter Grocery Store, the Chat-N-Chew in Turbeville, South Carolina, Logan International Airport, Boston Convention Center, Wake Forest Medical Center and Thirsty's 2. My point is that in all this time, I have sought innovation, created and distributed knowledge, with the use of technology over a very large geography. This situation is exactly what firms must contend with regarding telecommuters, and obviously on a much larger scale than previous studies have reported. How well they are able to connect the four is important; more significant is how knowledge and innovation are tempered with technology and geography. Peitchinis (1992) states it very well:

> The evolution of computer and telecommunications technology has changed the technostructure to such an extent as to be unrealistic to assume it constant, and foolhardy not to take it into account in the consideration of location decisions.

The single act of having a mobile work force renders the geographical realm less important in some ways, which can be reigned in by communications technologies. But for accessing and retaining knowledge that telecommuters

create or need, geography becomes very important, as does technology. For many firms, knowledge is at the core, where innovation and time to market is essential for a large portion of business. One way to create an advantage for a firm like this is to invest in the greatest knowledge resource: its employees. Technology then becomes crucial as a facilitator and is inseparable. Raspe and Oort (2006) maintain that ICT can speed up organizational processes through productivity and can be an optimal method of knowledge transfer when knowledge is codified – or becomes tangible. Herein lays the problem with a large telecommuting workforce. How is knowledge sought, exchanged, transferred and kept between telecommuter and employer? Knowledge is not easily tangible, and becomes more dynamic when technology is the medium that solidifies it, as is often the case with a remote, or telecommuting workforce. David Audretsch (2001) states that while the cost of transmitting information across geographic space is marginal and rendered invariant, the cost of transmitting knowledge, specifically tacit knowledge, rises with distance. Audretsch (2001) further elaborates:

> Geographic proximity matters in transmitting knowledge, because as Kenneth Arrow (1962) pointed out some three decades ago, such tacit knowledge is inherently non-rival in nature, and knowledge developed for any particular application can easily spill over and have economic value in very different applications. As Glaeser et al. (1992) have observed, 'intellectual breakthroughs must cross hallways and streets more easily than oceans and continents'.

Depending on what the firm produces and what level of technology is involved in the process, location dependencies vary. Most of the firms represented in the executive interviews are high technology firms. Rees & Stafford (1986) identify that some firms may be considered high-technology through the manufacturing process alone; while others are dealing in high-technology products, but very few do both. With this in mind, location variables can be placed in two categories: those that experience friction of distance, where the cost of moving materials, products, people or ideas across space are measured in miles, money, time and psychologically, and those associated with the characteristics of the area, such as labor, agglomeration, infrastructure and quality of life (Rees & Stafford, 1986). In regard to telecommuting, these are considerations that should be helpful in determining the importance of geography in firm innovation based on these characteristics. From this collection of literature we can state some of the factors that will impact this research question.

1. What level of technology is involved
2. How far must knowledge, ideas, and products travel
3. Is innovation internal, external, or acquired

Based on results from the survey and the interviews, this thesis will draw conclusions on the importance of geography to innovation of the firm.

CHAPTER III

DATA AND METHODOLOGY

The primary data in this study came from two sources. The first source is a survey administered to 1000 McKesson Corporation employees: 500 telecommuters and 500 traditional employees. The second source is an executive interview answered by 5 executives and managers who expressed interest in the survey, but were not able to participate.

Criteria for Selecting Firm

Previous surveys and studies have all used a variety of data sets or survey data. Any such data is very hard to come by, as was my experience. Regardless if some data may be based on a small sample size or focus on specific strata of the population, it allows us to become familiar and understand a wide variety of telecommuting situations and various aspects that surround it.

In order to contribute to the variety of data that exist, one goal was to secure a participating company that was large and had the resources and organizational structure to support a large telecommuting community. It was also important to have a sample of telecommuters that had a diversity of job titles and functions.

In order to carry out this study 60 firms were invited to participate in a *telecommuting and traditional employee survey*. Firms were selected based on one or all of the following selection criteria:

- Firms with high revenues (Fortune 100 as of December 2005)
- Firms known to have a keen technology prowess
- Firms with over a thousand employees.

Although seven firms expressed interest initially, and several made tentative agreements to participate, only one firm, McKesson Corporation, met all of the criteria, made a commitment to participate in the survey. Despite several attempts to persuade the other firms through emails and phone calls to participate in the survey, they were unable to due to various reasons. However, a few executives and senior managers were asked at a later time, after the completion of the survey, to participate in the executive interview on telecommuting, innovation and geography (see Appendix 1& 2). McKesson is a healthcare services company headquartered in San Francisco, CA that provides pharmaceuticals, medical supplies and technologies for the patient and doctor, as well as disease management services. With revenues reaching $88 billion in 2006, McKesson is ranked 16 on the Fortune 500 list and 30 on the Global 500 list (www.cnn.com, 2006). McKesson has over 26,400 employees in the U.S. and worldwide (www.McKesson.com, 2006).

McKesson Corporation provided a system-generated random sample of 500 telecommuters and a random sample of 500 traditional employees to be

invited to participate in the survey via email. The circumstances of this firm proved to be very unique in that McKesson is an umbrella for eight business divisions with a diverse geographic representation across the United States, and had no formal, corporate-wide telecommuting policy at the time the survey took place. McKesson has 22,377 employees in the US, with 15,473 having information technology (IT) connectivity (R. Spratt, personal communication, October 19, 2006). Those that don't have IT connectivity work primarily in production jobs. Of those with IT connectivity, 3,210 are telecommuters and 12,263 are traditional employees. What stands out the most about this firm is that 22% of its employees that have IT connectivity are telecommuters, or 14% of all employees in the US. Even though this number is not specific to just one location, it has the potential to have a great impact on the organization when considering the demographics to be presented.

Defining Telecommuting

Employees are entered in the McKesson computer system as either a telecommuter or a traditional employee. This designation must come from a manager. Even though a small portion of traditional employees may telecommute weekly or monthly, they are not telecommuters in the system unless designated as such. Approximately 12,000 McKesson employees have laptops with access to the network and systems from any location. This number consists of both telecommuters and traditional employees.

For the purpose of this study, a definition of a telecommuter and that of a traditional was given at the start of the survey. A telecommuter is an employee that works from a home, remote, telecenter or hoteling location, as compared to working in a traditional office setting, at least one day per week, and may include half-days. A traditional employee's primary workplace is at the company office location. There is a high degree of certainly that employees selected the correct survey based on the fact that employees are designated as either a telecommuter or traditional employee by the firm. It was know that the survey participants would be organizational employees, but the extent of the telecommuting program was not known. Even though respondents were given a definition, more important was how they perceived their work situation based on the designation as a telecommuter.

Procedure for Choosing Survey Questions

At the time the survey questions were created it was not known what firm would be participating. With this in mind, my goal was to design the survey as broadly as possible to capture data of interest and to account for various telecommuting situations. Questions in previous surveys measured satisfaction in various ways; however, it is hard to place this satisfaction on a definitive scale and solidify what the context of this satisfaction means to the telecommuter overall. Bélanger (1999) has a sound measure for satisfaction in her survey, but my line of questioning offers an alternative scenario to satisfaction or dissatisfaction.

Some surveys have been very specific, either by location or have focused on a specific stratum of the population; such as the large amount of telecommuters that are IS (sic) employees in the study by Bélanger (1999). By having a large firm like McKesson, which is an umbrella for 8 firms, a variety of job functions and titles were captured, as noted in Appendix 3.

A study by Igbaria & Guimaraes (1999) uses a survey sample of telecommuters and regular employees, but telecommuting is defined rather openly and the number of days per week spent telecommuting is not recorded. It does not specify how often the telecommuters work at the company office weekly.

The telecommuter's survey was designed to collect selective demographic information, as well as data on location, technical delay, positive and negative effects of telecommuting and satisfaction with telecommuting. I also used my own experience with teleworking and telecommuting to capture the lifestyle components of the survey. For the traditional employee's survey, general demographic data was collected; as was data that would measure the propensity to telecommute, job satisfaction, technical delay and location choices of this group. Questions to this group are not as extensive, as it was not the focus of the survey. Also, the survey was getting too large and a portion of questions had to be eliminated due to time constraints. The traditional employees serve as a control group for questions that are asked of both groups.

Questions on Satisfaction

This section asks questions related to job satisfaction and dissatisfaction and reasons for telecommuting. As noted in the literature review, Baily and Kurland (2002) believe that previous research has done little to measure general job satisfaction, but more so on satisfaction with telecommuting. This study holds satisfaction with telecommuting and job satisfaction as being mutual. In addition to the questions below, other factors to be considered with satisfaction are salary, education, age, hours worked, telecommuting tenure and frequency of telecommuting per week. Table 1 on page 42 shows the basic demographics of both telecommuters and traditional employees. The following questions (see Appendix D & E) are asked to evaluate satisfaction with telecommuting and if telecommuting is more of a lifestyle choice compared to a career choice:

1. Are you happy working as a telecommuter?
2. Would you rather work as a traditional employee?
3. Would you seek other employment if telecommuting were not available?
4. What do you like most about telecommuting?
5. What do you like least about telecommuting?
6. Why do you telecommute?

In addition to questions of satisfaction, traditional employees will also be evaluated on salary, education, age and hours worked. For our control group, the traditional employees are asked the following: 1) Are you happy working as a

traditional employee? 2) Would you rather telecommute? 3) For what reason would you rather telecommute?

Questions on Geography and Innovation of the Firm

Technology is the bridge that connects telecommuters and the firm. What effect does telecommuting have on innovation of the firm and the importance of geography? The answer to this question comes mainly from results of the survey and from evaluating the executive interviews in Appendix 1 and Appendix 2.

The Survey Procedure

The primary data for this research were collected by a survey administered to employees of McKesson Corporation. This firm provided a randomly generated sample of 500 telecommuter email addresses and 500 traditional (in-house) employee email addresses. Employees were sent an initial email invitation to participate in the survey, and a second reminder email several weeks later. The response rate for the telecommuter survey was 38% (n=188) and the response rate for traditional employees was 33% (n=164).

The telecommuting survey consisted of 25 questions and the traditional employee survey consisted of 21 questions. Several questions had open-text entry options. The survey was designed this way in order to compensate for the lack of knowledge about the participants, and to provide a better understanding of issues that may not be captured with answer choices provided in the survey questions. It also makes it easier to identify bias and sampling errors. The survey was designed using Dreamweaver MX 2004® using Perl server-side

scripting to dispense the survey responses into a comma separated value (CSV) format for easy retrieval.

A domain was purchased explicitly for the survey and respondents entered the survey with a username and password. The survey results were collected regularly and downloaded into an Excel sheet. Responses were tabulated with both Microsoft Excel Data Analysis® and with SPSS® statistical software.

Data and Methodology

The data of this study is primarily qualitative in nature and relies on the appropriate methodology to draw conclusions. The survey analysis also uses general descriptive statistics, some of which include a mean value, confidence level and standard deviation from the mean, as well as cross tabulation with chi-square values. Cross tabulation with chi-square values determines the significance of survey results used to evaluate satisfaction with telecommuting and telecommuting as a lifestyle choice. If chi-square values prove to be significant, then variables used in the construct will be considered as significant and mutually dependent. Interviews of executives and senior management regarding telecommuting as a lifestyle choice and the importance of geography will also be used to establish a basis for these measures.

CHAPTER IV

FINDINGS

Telecommuters in this survey defy findings from previous research in that they are full-time telecommuters, averaging 4.8 telecommuting days per week. The sample size for this group is 188. A total of 85% telecommuted between four and seven days weekly, 94% are full-time employees, and 47% are female. This group is also very educated and earns high wages. The average salary is $92,713, with 79% of respondents holding bachelor's degrees higher. It is possible that the salary may be high due to sales commissions or possibly bonuses. The average age is 43 years. A large percent (47%) of telecommuters have been telecommuting for McKesson for five or more years, with a mean of 5.4 years for the whole population. The average hours worked Monday-Friday is 47.4 with 73% reporting working on the weekend. Most telecommuters (88%) selected their *home* as their primary work location, and 8% selected *other*, while 4% used a *telecenter*. A large amount of telecommuters (75%) reported that their job requires them to work on-the-road or away from the office. Not all of this is due to jobs in sales as might be expected. This is explained somewhat in open-text entries and was further explained in an executive interview answered by the CIO of McKesson Corporation in Appendix A. In some cases telecommuters were hired as such, where no prior commute or ties to the office

existed or they transferred into the job, or either stayed on as telecommuters after an acquisition or closing of a location and did not want to relocate. Some stated that they were able to live in certain places due to family matters or medical conditions. The aggregated and descriptive statistics for telecommuters can be found in Table 1 below.

Table 1

Survey Demographic Aggregates

Demographics	**Telecommuter N-188**	**Traditional Employee N=164**
Male	52%	46%
Female	48%	54%
Age	43.4	40.5
Full-time	95%	96%
Salary	$92,713	$80,091
Hours M-F	47.4	44
Work on weekend/overtime	73%	64%
Bachelors degree or higher	79%	69%

Telecommuting situation

Telecommuter	
Telecommuting days per week	4.8
Years telecommuting	5.4
Work at home	88%
On-The-Road or away from the office required	75%

Traditional Employee

Are you able to login from home?

Yes	71%
No	29%

Work done after regular hours requires logging in to the network?

Yes	55%
No	13%

24% Telecommute 1 to 3 times a month
12% Telecommute 1 to 2 times a week

In contrast, the survey for traditional employees was not as large as that for telecommuters since it was not the focus of this study. The sample size for

this group is 164. For detailed aggregated statistics on traditional employees see Table 1. The average salary for this group is $80,091 with 96% being full-time employees. Traditional employees had an average age of 40.5 and 54% were female. 71 percent of traditional employees have the ability to login from home. The average hours worked Monday-Friday was 44, with 58% working on the weekend or after their regular business hours. A total of 81% reported that the work done on the weekend or after regular business hours required logging in to the company network. This group is also very educated with 69% of traditional employees holding a bachelors degree or higher.

Telecommuters include a higher number of males than females, and the opposite is true for traditional employees. This is partly explained by job function, since more males are usually working in information technology, technical, sales, and management positions. Many healthcare related jobs are not easily telecommutable, and since females usually hold the majority of these jobs, this is a possible explanation for the higher number of females working as traditional employees. A chi-square test was performed to see if the distribution of males and females was significantly different between telecommuters and traditional employees. The chi value was .413 with a p-value of .521, therefore, affirming that differences in gender are independent throughout the sample. All expected cell counts were greater than five, as seen in Table 2 below.

Table 2

Cross Tabulation of Genders

Telecommuters		Traditional Employees		Total
		Female	Male	
Female	Count	44	34	78
	Expected Count	42.0	36.0	78.0
Male	Count	40	38	78
	Expected Count	42.0	36.0	78.0
Total	Count	84	72	156
	Expected Count	84.0	72.0	156.0

Chi-Square Test for Table 2

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.413(b)	1	.521		

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 36.00.

Salary is higher among telecommuters due in part to the technical nature of their work and the high number of sales jobs. These considerations may increase the salary average due to sales commissions or bonuses. Telecommuters also include more degree holders than traditional employees. One observation that is not a surprise is that telecommuters work more hours during the week and on the weekend. Interestingly, when the survey results were coming in, traditional employees mostly responded to the survey during regular business hours, but those from telecommuters came in around the clock.

The propensity to telecommute among traditional employees is strong. A moderate amount (37%) entered that they telecommute between one and three half or whole days monthly or weekly, with home being the primary

telecommuting location, while 58% averaged logging in from home 3.1 times weekly. As noted earlier, 12,000 employees are supplied with laptops and have secure access to the company network, which includes telecommuters and a large portion of traditional employees. If you consider that many traditional employees have remote connectivity to the office and often use this as a means to work after normal business hours, then the potential to extend telecommuting to this group is great.

Telecommuting Satisfaction

Telecommuters are very satisfied with their job and wouldn't have it any other way; however, there are a variety of negative side effects to telecommuting, as this survey shows. For this section respondents were given an option of selecting *other* and giving an open-text response to these questions if no other answer was suitable. It was found that many of these open-text entries could be placed in one or more of the answers provided, or new categories could be created. The summary of the data will include adding these open-text entries to any appropriate existing categories or creating new ones that had a significant representation. These categories will not be used when interpreting results in order to maintain integrity of the findings. Table 3 goes over the results of satisfaction.

Are you Happy with Telecommuting?

A total of 76% of telecommuters selected that they *love* telecommuting, 20% selected that they *like* telecommuting and 4% selected that it was *just*

average. No respondent selected that they did *not* like telecommuting. Amazingly, 91% selected that they would not rather work as a traditional employee and 74% would seek other employment if telecommuting were no longer available.

What do you Like Least About Telecommuting?

On the negative side, 35% selected that not making career connections that occur in the office as what they like least about telecommuting, followed by 33% feeling alienated from others and 14% stating that it is not conducive to sharing ideas or concerns. Of those that selected *other*, 16% entered open-text entries and several could be placed into the following categories: 8% stated that there is nothing *not* to like about it, 5 % selected other for which no open-text entries fit into the other categories, 3 % entered lack or acceptance or understanding from coworkers and 1% citing lack of structure, as what they liked least about telecommuting. Other reasons given for dissatisfaction included: trouble separating work life from personal life and difficulty tracking down or contacting people.

Why do you Telecommute?

With this question, 41% selected *other* and entered open-text entries for why they telecommute. The *other* entries were placed into new or existing categories where possible. When asked why they telecommute, 29% selected that their company supports it, 20% cited that it is more efficient, 18% entered that it is a job requirement, 11% answered that they live too far from the office,

7% chose no or reduced commute, 6% have location dependencies due to family or health issues, 4% liked having more time with their family and 3% did not want to relocate after a nearby office closed.

Traditional Employee Satisfaction

Satisfaction questioning for traditional employees is not as extensive as that of telecommuters. In order to keep questioning short, only necessary questions that served as valid controls for the telecommuting group were used in the traditional employee survey.

Are you happy Working as a Traditional Employee?

A total of 17% selected that they *love* working as a traditional employee, while 44% just *liked it* and 23% found it *just average.* A total of 11 percent were *not that happy* with it and 4% did *not like* it. When asked if they would rather telecommute, 54% answered yes.

For What Reason Would you Rather Telecommute?

The most frequent reason selected for wanting to telecommute was for *no or reduced commute* (36%), followed by 24% wanting a *more flexible work schedule*, and 18% selected that it was *more efficient than working in the office.* Only 5 percent entered that they want a *more relaxed work environment*, 3% selected *no dress code* and 10% entered *other*.

Overall, respondents were very satisfied with telecommuting, regardless if required for the job or not. Even though there are negative aspects to telecommuting, this group is very satisfied with this way of working. Remember,

one possible reason for a small percentage not citing a reduced commute as a reason to telecommute is due to the fact that some of the jobs never required a commute to the office to begin with and are not near a company office. Randy Spratt, CIO of McKesson clarified in a personal communication that responses like these could be due minimally to closings, but are primarily a result of hiring directly into the job or are coming from transfers (February 25, 2007).

Table 3

Employee Satisfaction

Telecommuter

Would you rather work as a traditional employee?

Yes	9%
No	91%

Would you seek other employment if telecommuting were no longer available?

Yes	74%
No	26%

Are you happy with telecommuting?

Yes, I love it	76%
I like it	20%
It's just average	4%
Not that happy with it	1%
No, I don't like it	0

What do you like most?

More efficient than office	51%
No or reduced commute	21%
Flexible work schedule	16%
Relaxed work environment	5%
All of the above	2%
Other	3%

Traditional Employee

Would you rather work as a telecommuter?

Yes	55%
No	45%

Are you happy working as a traditional employee?

Yes, I love it	17%
I like it	44%
It's just average	23%
Not that happy with it	11%
No, I don't like it	4%

Telecommuter **Traditional Employee**

What do you like least about telecommuting?

Not making connections that occur in the office	35%
Feel alienated from others	33%
Not conducive to sharing ideas or concerns	14%
Nothing; Love it	8%
Other	5%
Lack of acceptance or understanding from coworkers	3%
Lack of structure	2%

Why do you telecommute?

My company supports this	29%
More productive/efficient work environment	20%
It is a job requirement	18%
I live too far from the office	11%
Location dependent family or health issues	6%
I like having no/reduced commute	7%
More time with family	4%
Office closed; didn't want to relocate	3%
Other	2%

For what reason would you rather telecommute?

Flexible work schedule	24%
More productive/efficient than office	18%
More family time	4%
More relaxed work environment	5%
No or reduced commute	36%
No dress code	3%
Other	10%

Negative aspects of telecommuting received a fairly equitable distribution with no smoking gun. Compared to traditional employees, telecommuters are much happier with their method of working. The propensity to telecommute among traditional employees is very strong. Not only does this group have the technical means to telecommute with access to the company network, but also attitudes toward telecommuting are favorable. According to this survey 36% are

telecommuting on a weekly or monthly basis, with 81% performing work at home after normal business hours that requires logging in to the company network. Obviously, traditional employees desire to shorten their commute and selected this as the main reason for wanting to telecommute. Unlike telecommuters, traditional employees live an average of 17 miles from their place of work with an average one-way commute time of 32 minutes. Therefore, traditional employees are affected more by seemingly long commutes since the average distance of telecommuters from their place of work is 482 miles. It is noticeable here, compared to previous research, that between those who are telecommuters and those that wish to telecommute, the difference in reasons for wanting to telecommute are disparately grounded.

Technical Delay Experienced by Both Groups

Technical delay experienced by telecommuters varied. Of this group, 88% experienced a weekly average of 35 minutes of technical problems that delayed their work. Technical delay among traditional employees was even more contrasting than it was with telecommuters. Of traditional employees, 83% averaged 42.2 minutes of technical problems that delayed their work weekly.

Table 4

Technical Delay

Descriptive Statistics

	N	Mean		Std. Deviation
	Statistic	Statistic	Std. Error	Statistic
Telecommuter Delay	165	35.0303	3.252657	**41.78114**
Traditional Employee Delay	138	44.2971	6.385219	**75.00933**

This was an interesting finding, since it is often reported that telecommuters are left to their own devices when it comes to technical problems or getting help may take longer. By looking at Table 4 it is clear that the standard deviation is very high and is enough to question the validity of this finding. Some respondents also entered having zero minutes of weekly delay. Attending to outliers is another alternative; however that will not be the focus of this study.

Location Factors of both Groups

Location of telecommuters was very surprising, with the telecommuter being an average of 482 miles from the nearest McKesson location. In order to gage the dependence telecommuters had on the company location, respondents were asked if they had dedicated office space at the company location, with the following choices for answers: yes, an office; yes, a desk; yes, a shared space; and no. A total of 36% of telecommuters had some type of dedicated office space at the company location, while 64% had no dedicated office space. Telecommuters were located in a total of 32 different states across the U.S. (see Appendix F)

Traditional employees were located an average of 17 miles from the company location with an average of 32 commute minutes one-way. Both of these averages had acceptable standard deviations. Traditional employees that took this survey were located in 22 different states (see Appendix G). Since telecommuters are primarily remote workers, it affords McKesson the ability to

extend its reach, or maintain market area that would not be practical to serve by establishing or maintaining a company office in these locations.

With such a dispersed workforce and high amount of telecommuters, company travel can play a large role in facilitating training or meetings. Randy Spratt, CIO of McKesson gave a rough estimate that around $2,000 is spent per non-sales employee per year and $6,000 for sales employees per year for car and air travel to annual meetings or product training events (R. Spratt, personal communication, February 25, 2007). The implication that telecommuting can have a huge impact on air travel is understated in general. If the same geographical proximities that exist for McKesson's telecommuters are similar to other corporate telecommuting situations, then air travel miles will be greatly influenced.

Satisfaction Characteristics of Telecommuters

The question to be answered here is two-fold. First, when considering both negative and positive aspects of telecommuting, are telecommuters really satisfied? Secondly, is telecommuting more of a lifestyle choice compared to a career choice?

It is hard for any study to separate the function of the job from how, when and where the work is committed, regardless of being a telecommuter or traditional employee. Even if you ask a traditional employee if they like their job, factors that prove pertinent include the type of work, coworkers or management, salary, and also the work environment or location. If we look at several

questions, or variables, in this survey we can begin to see that there is a strong indication that satisfaction with telecommuting is a good measure of general job satisfaction. The variables used to answer the question of job satisfaction are based on construct validity using cross tabulation and are said to be a valid construct based on the significance of the chi-square value. Construct validity is defined as "…the extent to which operationalization measures the concept which it purports to measure (Ghauri & Grønhaug, 2002; Zaltman *et al.*, 1977).

Previous research found that having a mandatory telecommuting situation might elicit dissatisfaction, as does limited possibilities to interact with others (Bélanger, 1999). The data from this survey support that telecommuters are typically full-time employees that telecommute 4.8 days per week on average, with 75 % being required to do so. Since many of the telecommuters were independent of the company office and were located on average 482 miles from the nearest company location, the presence of dedicated office space at the company location among telecommuters was used to determine if telecommuters had physical ties to the office; which would imply a higher degree of satisfaction based on previous research. Even though it is not known if telecommuters utilized the physical ties to the office to ameliorate the negative effects of telecommuting, the availability of this option should offer some relief.

A comparison of the distance in miles from the company office was done for those that had some kind dedicated office space at the company location and those that did not. Those that did have some kind of dedicated office space were

located an average of 470 miles from their telecommuting location to their company office, with a median of 77 miles. Those that had no office space were located an average of 471 miles from their telecommuting location to their company location with a median of 170 miles. This could offer a big clue as to why those that have some type of office space are not more satisfied. If the distance is too great to drive to the office, then they likely will not drive the distance to take advantage of these physical ties. The median for those with office space is lower than those without office space and should still make trips to the office viable for over half of this segment of the sample. The constructs based on this variable are still a good measure despite the large average of miles from the company location.

Dedicated office space is reported by respondents as having their own office, their own desk or a shared workspace at the company location; of which 35% reported they have in some variety. Telecommuters that had some type of dedicated office space telecommuted on average 4.5 days a week, while those with no office space did so 4.9 days a week. The difference in days telecommuting per week is negligible. Those that reported having no office space have been telecommuting for the firm an average of 6 years and those with dedicated office space averaged 5 years.

Seven constructs will be taken together to forge an answer to the question regarding telecommuting and satisfaction. These constructs, along with the executive interviews, will also be used to answer if telecommuting is more of a

lifestyle choice compared to a career choice. The first three constructs are based on telecommuters that have dedicated office space at the company location, and how that relates to satisfaction with telecommuting and positive or negative aspects of telecommuting. As noted in the literature review, telecommuters that have physical ties to the office are more likely to express higher job satisfaction and experience less the negative effects of telecommuting.

The last four constructs are based on satisfaction with telecommuting and positive or negative aspects of telecommuting. When considering the negative effects of telecommuting and positive aspects of telecommuting, these constructs will determine overall satisfaction with telecommuting and answer if telecommuters really are satisfied. Constructs 6 and 7 support the basis that positive and negative effects of telecommuting are dependent on satisfaction, and they should be significant at .05 to be considered valid.

Since these constructs are measured by the significance of a chi-square value, the 20% rule will be used to contemplate validity. If 20% of the cells have values less than five, although this is generally acceptable, the validity of the construct should be considered cautiously. A summary of the construct results below may be found in Table 5 and the calculation of the constructs may be found in Table 6.

For the control group (traditional employees), one cross tabulation is represented in Table 7. The traditional employee survey was much smaller than the traditional employee survey since it was not the focus of this study. However,

this cross tabulation table will test the same two variables as posed to the telecommuters on satisfaction with telecommuting and the desire to work as a traditional employee. Table 7 contains the variables: *satisfaction with working as a traditional employee* and *the desire to telecommute*. The chi-square value for this table will either strengthen or weaken telecommuting as a lifestyle choice.

Construct 1: Dedicated Office Space* and *Satisfaction with Telecommuting

A graduated scale measuring most satisfied to least satisfied was used to measure satisfaction with telecommuting in the survey. This proved to be a problem when constructing the chi-square table because more than 20% of the cells had an expected count less than five. Since telecommuters registered such a high percentage of satisfaction anyway, and no respondent selected that they did not like telecommuting, the lowest value on the scale, the variable of *satisfaction with telecommuting* was compacted to represent two values: *highest satisfaction* and *moderate satisfaction*. This compacted variable was used consistently throughout all calculations for consistency. A chi-square test of *satisfaction with telecommuting* and *dedicated office space* had a low chi value of .052 with a *p*-value of .819. This does not support that having physical ties to the office increases job satisfaction. It does not mean that those who had no dedicated office space were more satisfied, just that being able to work in the office on occasion or having that physical connection to the office, was not associated with an increase in satisfaction with telecommuting.

Construct 2: Dedicated Office Space and *What do you Like Least About Telecommuting*

In the attitudinal section of the survey respondents were asked what they liked least and liked most about telecommuting and had a choice of 5 responses. Both likes and dislikes showed no significance in the chi-square value or the *p*-value when calculated with *dedicated office space*.

When asked what they liked least about telecommuting, respondents had a choice of the following: *Not making career connections that occur at the office, feeling alienated from others, not conducive to sharing ideas or concerns about work issues, lack of structure, other*. The chi-square value for this construct was 3.486 with a p-value of .480, with 20% of the cells having a value less than 5. The chi-square was also calculated by compacting the responses of *lack of structure* with o*ther.* Since only three respondents selected *lack of structure,* it was compacted because it fit in best with *other* responses. This yielded no significance or strong chi-square value, but did bring all cell values above five. This construct supports that negative effects of telecommuting had no bearing on having dedicated office space or physical ties to the office. The ability to work in the office did not ameliorate negative effects of telecommuting.

Construct 3: Dedicated Office Space and *What do you Like Most About Telecommuting*

Survey respondents selected among five variables for what they liked most about telecommuting. Positive effects of telecommuting are represented by

the following variables: *Flexible work schedule, relaxed work environment, no commute or reduced commute time, more efficient than working in the office*. The chi-square value of this construct was 3.835 with a p-value of .429, proving to be insignificant. A total of 20 % of the cells had a value less than five. Although compacting the lowest variable, *relaxed work environment* with *other,* did bring all cell values above five, it did not become significant. This construct also supports that positive feelings about telecommuting are not related specifically to having dedicated office space, as would be expected.

Construct 4: Satisfaction with Telecommuting and *Would you Rather Work as a Traditional Employee*

The chi-square value for this construct is very high at 38.942 with a p-value of .000. Although very significant, it should be read cautiously since one cell value (25% of all values) was less than five. The large number of those with highest satisfaction with telecommuting is very strong here. Even the majority of those that had moderate satisfaction with telecommuting would not rather work as a traditional employee. The individual chi value of those that answered *no* they would not rather work as a traditional employee contained the largest number of those with highest satisfaction and was independent in relation to satisfaction with telecommuting. This would support telecommuting as a lifestyle choice since wanting to work as a traditional employee is not related to satisfaction with telecommuting. Those that answered *yes*, they would rather work as a traditional employee, were strongly related to satisfaction with

telecommuting and this sustains findings that those who are forced to telecommute, or don't want to telecommute, may have lower job satisfaction, or are not that satisfied with telecommuting.

Construct 5: Satisfaction with Telecommuting and *Would Seek Other Employment if Telecommuting was not Available*

This construct measures the relationship between those that have high or moderate satisfaction and those who would seek other employment if telecommuting were no longer available. There is virtually no relationship here between these two constructs. The chi-square is .321 and is insignificant with a p-value of .571. The expected values are greater than five, therefore making this construct valid. The insignificance of this construct means that any other such sample drawn from this population would elicit the same results that they would or would not seek other employment if telecommuting were no longer available. The significant part of this is that it signals that telecommuting is a lifestyle choice since the desire to telecommute - or seek other employment if telecommuting were no longer available - is independent of satisfaction with telecommuting. This also supports that the ability to telecommute is more important than satisfaction with telecommuting.

Construct 6: Satisfaction with Telecommuting and *What do you Like Most about Telecommuting*

This construct will show how dependent positive aspects of telecommuting are related to satisfaction with telecommuting. If there is a strong dependence

here then it is assumed that positive attributes, such as more efficiency, no commute and flexibility are dependent on high or moderate satisfaction with telecommuting and are dependent on satisfaction with telecommuting. The chi-square value for this construct is 16.257 with a p-value of .003. A total of 20% of the cells also have values lower than five. Even though this would meet the 20% rule, the table was also compacted by adding the cell with the lowest count, *more relaxed work environment* in with the *other* variable. This did make the low cell values greater than five, with a chi-square of 16.257 and significant at .001. Since positive attributes of telecommuting are dependent on satisfaction with telecommuting then this is a very strong indication from the population.

Construct 7: Satisfaction with Telecommuting* and *What do you Like Least about Telecommuting

This construct should measure whether satisfaction with telecommuting and negative attributes of telecommuting are dependent on each other. This is an important construct since those that report negative feelings about telecommuting should generally have moderate satisfaction compared to highest satisfaction. A total of 20% of the cells have values less than 5, with a chi-square of 16.105 and p-value of .003. Although this construct does meet the 20% rule, it is worthwhile to try compacting the lowest variable, *lacking of structure, with the other variable and determining* if it will make a difference. Since this variable had the fewest entries and fewer than some of the aggregated entries found in *other*, it is plausible to see what the result would be in compacting these two variables.

The difference decreased the chi-square value to 7.528 and a p-value of .057. The negative effects represented here are related to satisfaction with telecommuting and seem to be a good indicator of dissatisfaction with telecommuting.

Table 5

Construct Results Summary

Construct Number	
1	Dedicated office space or physical ties to the office are not related to higher satisfaction with telecommuting.
2	Having physical ties to the office does not ameliorate negative side effects of telecommuting.
3	Having positive feelings about telecommuting is not related to having physical ties to the office.
4	Those who are forced to telecommute or would rather work as a traditional employee have lower satisfaction with telecommuting.
5	The desire to seek other employment if telecommuting is not available is independent of satisfaction with telecommuting.
6	Positive feelings about telecommuting are dependent on satisfaction with telecommuting.
7	Negative effects of telecommuting are related to satisfaction with telecommuting.

Based on the results from the survey and the culmination of the construct validity measures it is possible to answer the question of satisfaction of telecommuters. Are telecommuters generally satisfied with their way of working despite negative effects of telecommuting? This question can be answered with a resounding yes. From constructs 1, 2, and 3 it is obvious that regardless if telecommuters utilized their dedicated office space, having physical ties to the office did not have an effect on satisfaction with telecommuting and having

physical ties to the office is not related to positive aspects or negative effects of telecommuting. Since these are full-time telecommuters, most important to them is how, when and where they work. In this case satisfaction is not related to having dedicated office space at the company location. If positive or negative feelings about telecommuting are not related to or dependent on a physical connection to the office, then one inference here is that the single act of telecommuting is a determinant of such positive or negative feelings.

In the last set of constructs, 4, 5, 6, and 7, satisfaction with telecommuting is dependent on positive or negative feelings of telecommuting, and matters if working in a traditional office is preferred to telecommuting. If the measure here is considered valid and these constructs are acceptable, then satisfaction is derived from telecommuting specifically.

Table 6

Construct Calculations

<table>
<tr><th>Constr.</th><th>Response Profile</th><th>Chi-Square</th><th>df</th><th>p</th><th>cells < 5</th></tr>
<tr><td>1</td><td>rows: Dedicated office space available
columns: Satisfaction with telecommuting

<table><tr><td></td><td>highest</td><td>moderate</td></tr><tr><td>yes</td><td>48</td><td>16</td></tr><tr><td>no</td><td>88</td><td>27</td></tr></table></td><td>.052</td><td>1</td><td>.819</td><td>0
(0%)</td></tr>
<tr><td>2</td><td>rows: Dedicated office space available
columns: What do you like least about telecommuting?

<table><tr><td></td><td>[A]</td><td>[B]</td><td>[C]</td><td>[D]</td><td>[E]</td></tr><tr><td>yes</td><td>21</td><td>7</td><td>17</td><td>2</td><td>11</td></tr><tr><td>no</td><td>29</td><td>15</td><td>40</td><td>1</td><td>25</td></tr></table>Legend
[A] Feel alienated from others
[B] Not conducive to sharing ideas / concerns</td><td>3.486</td><td>4</td><td>.480</td><td>2
(20%)</td></tr>
</table>

Constr.	Response Profile	Chi-Square	df	p	cells < 5
	[C] Not making career connections that occur in office *[D]* Lack of structure *[E]* Other				
	rows: **Dedicated office space available** columns: **What do you like least about telecommuting? (compacted)** *[A]* *[B]* *[C]* *[D] + [E]* *yes* 21 7 17 13 *no* 29 15 40 26	**1.889**	**3**	**.596**	**0** *(0%)*
3	rows: **Dedicated office space available** columns: **What do you like most about telecommuting?** *[F]* *[G]* *[H]* *[I]* *[J]* *yes* 11 18 27 3 4 *no* 17 20 61 7 10 **Legend** *[F]* Flexible work schedule *[G]* No or reduced commute *[H]* More efficient than office *[I]* Relaxed work environment *[J]* Other	**3.835**	**4**	**.429**	**2** *(20%)*
	rows: **Dedicated office space available** columns: **Positive aspects of telecommuting (compacted)** *[F]* *[G]* *[H]* *[I] + [J]* *yes* 11 18 27 7 *no* 17 20 61 17	**3.830**	**3**	**.280**	**0** *(0%)*
4	rows: **Satisfaction with telecommuting** columns: **Rather work as a traditional employee** *yes* *no* *highest* 2 138 *moderate* 14 30	**38.942**	**1**	**.000**	**1** *(25%)*
5	rows: **Satisfaction with telecommuting** columns: **Would seek other employment if telecommuting not available** *yes* *no* *highest* 104 34 *moderate* 32 13	**.321**	**1**	**.571**	**0** *(0%)*

Constr.	Response Profile	Chi-Square	df	p	cells < 5
6	rows: **Satisfaction with telecommuting** columns: **What do you like most about telecommuting?**	**16.257**	**4**	**.003**	**2** *(20%)*

	[F]	*[G]*	*[H]*	*[I]*	*[J]*
highest	21	24	79	6	9
moderate	7	15	10	4	6

Legend

[F] Flexible work schedule
[G] No or reduced commute
[H] More efficient than office
[I] Relaxed work environment
[J] Other

Constr.	Response Profile	Chi-Square	df	p	cells < 5
	rows: **Satisfaction with telecommuting** columns: **What do you like most about telecommuting? (compacted)**	**16.257**	**3**	**.001**	**0** *(0%)*

	[F]	*[G]*	*[H]*	*[I] + [J]*
highest	21	24	79	15
moderate	7	15	10	10

Constr.	Response Profile	Chi-Square	df	p	cells < 5
7	rows: **Satisfaction with telecommuting** columns: **What do you like least about telecommuting?**	**16.105**	**4**	**.003**	**2** *(20%)*

	[A]	*[B]*	*[C]*	*[D]*	*[E]*
highest	42	13	46	0	28
moderate	8	10	12	3	9

Legend

[A] Feel alienated from others
[B] Not conducive to sharing ideas / concerns
[C] Not making career connections that occur in office
[D] Lack of structure
[E] Other

Constr.	Response Profile	Chi-Square	df	p	cells < 5
	rows: **Satisfaction with telecommuting** columns: **What do you like least about telecommuting? (compacted)**	**7.528**	**3**	**.057**	**0** *(0%)*

	[A]	*[B]*	*[C]*	*[D] + [E]*
highest	42	13	46	28
moderate	8	10	12	12

Table 7 below represents a strong indication that the desire to telecommute among traditional employees is dependent on satisfaction with

working as a traditional employee. This same construct (4) performed for telecommuters showed that those that are forced to telecommute or would rather work as a traditional employee have lower satisfaction with telecommuting. Whether a traditional employee selected yes or no as wanting to telecommute, the relationship to satisfaction is very strong.

Table 7

Traditional Employee Satisfaction and Desire to Telecommute

Happy working as a traditional employee?			Rather telecommute?		Total
			Yes	No	
1=Most satisfied	1	Count	7	19	26
		Expected	14.3	11.7	26.0
	2	Count	25	48	73
		Expected	40.2	32.9	73.0
	3	Count	32	5	37
		Expected	20.4	16.7	37.0
	4	Count	18	0	18
		Expected	9.9	8.1	18.0
5=Least satisfied	5	Count	6	0	6
		Expected	3.3	2.7	6.0
Total		Count	88	72	160
		Expected	88.0	72.0	160.0

Chi-Square Test for Table 7

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	55.442(a)	4	.000

a 2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.70.

Telecommuting as a Lifestyle Choice

Is telecommuting more of a lifestyle choice compared to a career choice?

Having had experience with teleworking and telecommuting myself, I suspected that this was a real issue with telecommuters. How does one move up and progress in their career by being a telecommuter and not having a presence at the office? The answer is that they most likely don't. This is supported further by the answers to the executive interviews in Table 6 below. If the sum of the constructs alone is not enough to support telecommuting as a lifestyle choice, the answers to the executive interviews strongly support this conclusion. In Table 6 below, the Chief Information Officer from McKesson Corporation and four other executives and managers from various firms were asked what their thoughts were on telecommuting being more of a lifestyle choice compared to a career choice. Without a doubt, the opinions here on telecommuting support a lifestyle choice compared to a career choice. Some telecommuters may be complacent in their careers and actively choose to maintain their telecommuting lifestyle, while other reasons are due to generational differences. Almost all research on telecommuting that recognizes the negative aspects of telecommuting recommends more face time in the office or career development plans to amend the negative effects of telecommuting on alienation and career advancement. As this survey has shown, despite these negative effects telecommuters are highly satisfied. If all of the executive interviews attest that telecommuting is more of a lifestyle choice compared to a career choice, then perhaps a forthright approach with clear expectations, by both employees and employers, would be better for administering organizational telecommuting programs.

From the construct calculations, as well as the survey, we know that telecommuters are highly satisfied despite the negative effects of telecommuting. Construct number 5 indicates telecommuting is a lifestyle choice because it supports that no matter how satisfied telecommuters are, highly or moderately, the desire to seek other employment if telecommuting were not available is a likely scenario irrespective of satisfaction with telecommuting. Being able to telecommute above all else – not making career connections and not sharing ideas or concerns- indicates a lifestyle choice.

Table 8

Telecommuting as a Lifestyle Choice

Company, Name, Title	What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?	Supports lifestyle question?
McKesson Corp. Randy Spratt Executive V.P. & CIO San Francisco, CA	I think that it is very difficult to make substantial career progress in a work@home situation, with the possible exception of sales-related jobs. I believe that most work@home jobs are largely made on lifestyle at the mid-tier and above professional level, and more of a blend of lifestyle and career (meaning, the lifestyle is acceptable and the job is acceptable as a resume entry) decision at the lower job levels.	YES
Siemens Stephan Meyer HR Strategy US Region and IT Applications for HR; Former divisional CIO for Siemens. New York, NY	In regard to full time telecommuting, I guess it is more a life-style choice. I wouldn't say that somebody chooses a career as a telecommuter. Now, telecommuting is really only an option for a limited set of careers. So in theory, somebody could make a career decision based on the fact that one option is more likely to allow for telecommuting than another, if telecommuting is an important lifestyle choice for that person.	YES
Sara Lee George Chappelle CIO, Chicago, IL	I think it's definitely more of a lifestyle versus career choice, particularly as you progress to higher levels in the organization.	YES

Company, Name, Title	What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?	Supports lifestyle question?
General Motors Mark Harasim Senior Administrator GMNA Policy Development & Employment Relations Detroit, MI	I view it as a generational lifestyle choice. Typically, Generation X and Y employees demand/expect this type flexibility in their work assignments. It is an expectation that they generally have coming into the job. They also have difficulty conforming to a company's policies that do not provide this type of desired flexibility. In such cases, we see issues with retention. There is also some residual resistance to telecommuting by longer service employees because (a.) they were never provided this type of flexibility in their career, either because technology was not in place to support such an arrangement, or philosophically their leadership placed significant value on face time, or (b.) those employees working offsite are viewed by their in office peers as not fully utilized and/or not subject to any of the walk-up assignments that may arise. As such, they feel they are subject to extra work, simply because they are in the office and the telecommuter is not. Agreeably so, this is an issue leadership needs to address to ensure that ALL employees are fully engaged and working productively.	YES
Duke Energy Terri Alsop IT Talent Management Coordinator Charlotte, NC	While I can imagine that some individuals would choose a career based on their ability to telecommute, it is much more of a lifestyle choice at Duke Energy. When our work-at-home program is implemented in its more permanent form, it will be seen as work/life balance option and not a career enhancer.	YES

Telecommuting, Geography and Innovation of the Firm

With telecommuting becoming so popular and the technology that enables it becomes more advanced, is geography still important to innovation of the firm? With McKesson, 21% of the workforce that has IT connectivity telecommutes. From the survey we know that the telecommuters are widely dispersed and cover a large geography, averaging 482 miles from the company office. They are very satisfied with telecommuting, but also feel the negative effects of telecommuting.

Tenure with telecommuters is also very strong and above the national average. Just by considering the attributes from the survey we can state that geography is not that important to telecommuters, but it is important to the firm.

The executive interviews in Appendix 1 and 2 question the panel of executives and managers on the importance of innovation and geography to the firm. Overall, the answers were varied, most likely due to each firm's unique geographic dependencies and experience with telecommuting. The dual sentiment is that geography is still important for collaboration where creativity and ideas feed off each other and must have a physical presence to work effectively, and the other sentiment is that telecommuting is a good surrogate for innovation in the workplace, allowing employers to choose the most talented employees. This sentiment supports the view by Audretsch (2001) and Glaeser et el. (1992) that ideas and creativity, the cornerstones of innovation, must cross hallways and streets more easily than oceans and continents.

The potential to affect the firm here is huge. When companies experience most of their growth through acquisition or developing new products, communication and teamwork is vital to creating and growing innovation. For most large firms, having research and development (R&D) or innovation in one spot is not possible, nor may it be logical. Telecommuting creates a paradox in this respect. It allows firms to pick the best people wherever they are, canceling out the effects of geography, but it creates a geographical gap if these people are remote workers or telecommuters, and are not able to take advantage of tacit

knowledge and learning opportunities that occur in the firm as Audretsch (2001) noted. Advancing technologies are able to facilitate some of these externalities by having company intranet forums, Instant messaging, enabling work-wikis[10], supporting and encouraging video conferencing. In an online video interview, Mr. Spratt, CIO of McKesson Corporation, even recognizes the importance and presence of online social networking for telecommuters (ZDNet, 2006). With these newer collaboration tools, the advantage to both employees and employers is mutual, but may be more important for the firm in that they are able to keep this knowledge as employees come and go. If telecommuters are not benefiting from knowledge or learning from the firm, then the firm may not be benefiting from the telecommuter's talents.

In regard to telecommuting, we can examine some of the factors drawn up in the literature review and make determinations on innovation based on these factors. For the firms that might have high-technology production or manufacturing processes, such as McKesson, Siemens and GM, geography was deemed important with the exception of GM. Both Siemens and McKesson also offer high-technology products or services as defined by Rees and Stafford (1986) and generate innovation internally, as well as through acquisition. In the case of Duke Energy and Sara Lee, they operate in very specific or localized markets. Sara Lee has the strongest locational dependency and looks to geographical linkages for innovation.

[10] Wiki (MediaWiki) is a form of documentation that can be tagged for searching, where multiple users can contribute and edit its content. (www.wikipedia.org)

If knowledge or ideas must travel far and if innovation is internal, external and acquired, then geography is still important. When telecommuters are working around high technology products or services and they are located remotely from the firm, then geography becomes more important than if they are located closer to the firm and can benefit from local linkages to the firm and from agglomeration activities. However, more research is needed to further determine what other factors influence the importance of geography on firm innovation in regard to a mobile and remote telecommuting workforce.

The conclusion about geography is that it is still important in two respects. For the firm, geography matters for creativity and innovation and summoning the best talent for the job. Telecommuting enables a firm to have the best talent regardless of location. The transfer of knowledge, tacit knowledge specifically, is critical for the innovative process and telecommuting does not allow for this to work optimally. Particularly, collaboration and team interactions are most affected by geography. The greater the distance telecommuters are located from the firm, and the higher the level of technology involved, geography becomes more important for innovation. Even though the differences in the firms represented here vary widely, geography is still important for firm innovation.

CHAPTER V

CONCLUSION AND FUTURE DIRECTIONS

The results from this survey show that telecommuting has taken another turn in the size and scope of its role in the firm. Two unexpected findings were the sheer distance the telecommuters were located from the company location and that they would be telecommuting full-time, averaging 4.8 telecommuting days per week. Since previous studies have been limited by either location, technology or willing participants, it was not suspected that telecommuters would largely be located independently of the company. When telecommuting first started in the 70's it was about bringing technology from the workplace into the home. Now it is about bringing technology used at home into the workplace; wherever the workplace may be. Randy Spratt, CIO of McKesson Corporation sums it up perfectly in a personal communication on telecommuting and mobility in the hands of technology:

> In the end, I think, it is the issue of being able to work wherever we may wish to work that is at the heart of the sea of change, and that is changing the definition of the workplace, the home, the way hotels and public spaces (like Starbuck's and libraries and airports) are configured, the way we plan and take vacations, our social interactions and our choice of where we spend our money as consumers. The lines of the tools we need to work and the tools we need to socialize, recreate, educate, and even raise our children are forevermore blurred and rapidly becoming indistinguishable (April 23, 2007).

Although it was debated in previous research whether telecommuting may or may not cause urban sprawl (Nilles, 1991), moving outwards from the city (Ellen & Hempstead, 2002), or impact residential location choices (Ory & Mokhtarian, 2005[a]), this was considered in more of a local or regional context, from the metropolitan area outwards. In the context of Mr. Spratt's assessment it is not just about moving to the suburbs or the hinterland, it's about having the freedom to move from Greensboro, NC to Charleston, SC or Boston, MA, or wherever wireless internet may take you. More importantly, in this survey we saw the possibility for people to stay where they were and not have to move just because their work does. The technology that facilitates telecommuting on such a wide scale has changed over the last five years and the research needs to change with that. If telecommuting is indeed more of a lifestyle choice, then the effects of this on the firm and the employee should be examined closer.

Telecommuting has changed the dynamic of the firm not just by drawing a line in the sand on career advancement for some telecommuters and by erasing the geographical boundaries that confine, it is the magnitude at which it is taking place within the firm that should receive more attention in future research. As noted in the executive interview (Appendix A) with Mr. Spratt, McKesson's telecommuting workforce is increasing at a faster rate than the traditional employees and the attrition rate has actually decreased compared to their traditional employees. No other research has uncovered such a difference in the

growth rate of this class of telecommuters. It would be beneficial to know how widely this it is occurring at other firms.

Since the telecommuters in this survey were so dispersed and rely on flying, possibly as much as driving, as a means to travel to their company office when required, then it would be beneficial to examine the impacts of telecommuting on air travel more closely. It is unknown how many firms might have a similar telecommuting situation; therefore, special attention needs to be given to the effect such a geographic dispersion this has on the firm and the region; particularly in regard to regional account flows.

There are many reasons for telecommuter satisfaction and dissatisfaction. This study supports that even after both negative and positive aspects are examined, it is the act of telecommuting itself, which is the most important. Although it isn't known in what way, or if telecommuters utilized physical ties to the office, having this option was not related to having higher satisfaction. With this new insight to telecommuter satisfaction and the lifestyle choice, how will this affect the employee-employer relationship within the firm? If employers know that telecommuters are satisfied with telecommuting regardless, and are making a lifestyle choice, should they be concerned with career advancement of telecommuters? And lastly, do telecommuters realize they are making a lifestyle choice over a career choice?

This study found that just because one telecommutes a few times a month, it does not mean you are a telecommuter. That distinction is often given

by the employer and may affect the actual of number of people that are counted as telecommuters. Not only is it important to consider the distinction given to the employees as being a telecommuter, but also it is the perception of what a telecommuter is that was most interesting. Even though 36% of traditional employees reported telecommuting weekly or monthly on a regular basis, they chose to take the traditional employee survey. In this study the telecommuters were telecommuters in the deepest sense, but traditional employees should not be considered as telecommuters just because they do so 2-3 times a month. Making a distinction in the difference between those who telecommute and those who are telecommuters and the individual's perception should be addressed in future research, as well.

The important contributions from this research show that not all telecommuting is happening on a part-time basis or infrequently, as typically reported in previous studies (Ellen& Hempstead, 2002; Baily & Kurland, 2002), and as the technological and social aspects of telecommuting converge, the spatial mobility of telecommuters has the possibility of becoming geography-free. In future research we need to think beyond the metropolitan or region and look at the specific conditions that support a truly mobile workforce. Another notable contribution from this study is that it addresses telecommuting as a lifestyle choice. Even though other research has examined lifestyle quality (Bernardino, 1996) or choice models in relation to lifestyle (Salomon, 1998), this study shows that top-level management widely believe that telecommuters are making a

lifestyle choice compared to a career choice when they telecommute. Even though it is known telecommuting may hinder advancement in the firm, more research should focus on the generational and career-level determinants that directly result in rendering telecommuting as a lifestyle choice.

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APPENDIX A

Executive Interview on Survey

Interview Regarding Survey Results, Telecommuting, Geography and Innovation

Randy Spratt, Executive Vice President & CIO of McKesson Corporation

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1. Why did you agree to participate in the survey?
To gain a better understanding of the work patterns, issues, and satisfaction of our at-home workforce. We believe that our at-home workforce will expand relative to our traditional office workforce, and therefore wish to understand possible changes or improvements that may be needed in our programs, strategies, and approaches to make this successful.

2. Many economists, researchers and academics think that geography is not as important as it use to be for firms. Where and how a firm's innovation takes place has been largely dependent on geography in the past, and variably still is. For example, XYZ Fashion House (fictitious name) has an R&D office in High Point, NC, where it may take advantage of textile and furniture agglomeration activities. A quick look at their registered patents will show that they benefit from geography in this respect. For McKesson, this might not be as important depending on the nature of the work. A look at its patents seems to show that R&D may be decentralized, perhaps along the division of its subsidiary companies. Keeping in mind that for innovation of the firm to be working optimally, the transfer of knowledge is very important; even more important is tacit knowledge. Of McKesson's workforce with IT connectivity, 21% are telecommuters. We know from the survey that telecommuters are alienated, don't feel they make career connections and to a degree, have a hard time sharing ideas or concerns. The act of telecommuting alone will have an effect on tacit knowledge. These combined factors have the potential to affect innovation of the firm. **Could you please answer how important geography is to McKesson in respect to R&D and innovation, and in what way telecommuters may contribute to or hinder innovation of the firm? Any other thoughts from your perspective on the importance of geography to the firm?**

Geography at McKesson regarding R&D and innovation is largely coincidental in origin but becomes important in present operations. Most of our technology businesses were acquired, and most of these acquisitions were left in their original location to preserve the intellectual capital and expertise. The most successful of these technology acquisitions evolved to become the R&D centers for the company, and most R&D and technology innovation now arises out of these centers, or is managed out of these centers. Telecommuting is a regular part of these centers, as is offshore work; certain tasks, such as individual design, development, and testing, is particularly suited to telecommuting, whereas collaboration and group design/review sessions are more challenging.

3. What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?
I think that it is very difficult to make substantial career progress in a work@home situation, with the possible exception of sales-related jobs. I believe that most work@home jobs are largely made on lifestyle at the mid-tier and above professional level, and more of a blend of lifestyle and career (meaning, the lifestyle is acceptable and the job is acceptable as a resume entry) decision at the lower job levels.

4. What role does telecommuting play in McKesson's strategy and what does it mean for McKesson's competitive advantage?
Work@home plays a variety of roles, from strategic to tactical. Major deliberate moves into this area have come from our disease management businesses, where we employ hundreds of nurses in their homes in virtual call centers to help chronically ill patients manage their conditions through telephone intervention and coaching, and also from home-based sales force initiatives. The former represents a significant advantage in both cost (much less expensive to equip a home with the needed IT than to lease space in a call center) and in ramp-up time in this rapidly growing business, where each growth stage is a large increment of covered lives rather than a gradual growth process; the latter represents an advantage in being able to place representatives close to the hospitals or physicians that they serve without losing access to the systems and collaboration they require.

5. How will (does) McKesson include telecommuters in its organic growth principles and in what way is this carried out through policy?
Work@home decisions are largely left to individual business units; McKesson's central policies provide primarily for access to benefits, equitable performance and compensation practices, and equitable administration. We extend IT connectivity (email, network access, phones, fax, printers, etc) into each home office to ensure access to applications and to communications, and major work segments (such as sales forces, nurses, etc) are deliberately brought in for training or group communications on a regular (annual or semi-annual) basis.

7. For an employee that is not classified as an at-home worker, what are their delimitations in being able to telecommute?
Individual decisions are at the discretion of individual business units; managers make the determination of whether or not an employee may telecommute and oversight of these decisions is limited to demonstration of an equitable and rational process for making these decisions.

8. Some telecommuters responded that they did not want to relocate with the company, or that their nearby office closed down and they didn't have one that they report to. What was going on at McKesson that made this scenario likely for a handful of telecommuters? This response indicates that being in their current location was more important than moving with the company.
As noted above, McKesson has acquired many companies over the last ten years. Occasionally, when such an acquisition occurs, one or more branch offices are closed and consolidated with other McKesson offices; at other times, as products near the end of their lifecycle and the staff associated with the product dwindles, we will close an office associate with that product and allow the remaining support staff to either relocate or work at home.

9. In what ways does McKesson include or try to include telecommuters in office or organizational culture?
See notes in 5, above; also note that we regularly use webinars and teleconference calls for large-scale communications.

10. Is McKesson's overall growth in percentage terms reflective of the percentage increase in telecommuters? (i.e. has most of your employee growth been in telecommuting jobs)
The work@home population has been growing more rapidly than the overall population; in the last year, the percentage of the overall employee population that works at home has increased from approximately 15.5% to approximately 18%; the general employee population has grown from approximately 22,200 to approximately 23,300 in that time.

11. What is the attrition rate of telecommuters compared to traditional employees?
Please see attached presentation. Voluntary termination refers to employees leaving of their own volition; involuntary termination refers to employees that are terminated for non-performance or other cause, or due to reductions in force.
Voluntary attrition for traditional employees has increased from 12.5% of this population in 2004, 14.4% in 2005, and 15.5% in 2006. Attrition for telecommuters was 10.8 % in 2004, 13.1% in 2005 and 13.1% in 2006. Considering that the number of telecommuters has increased over the last three years at McKesson, the attrition rate for this group actually decreased in 2006.

APPENDIX B

Executive Interviews

Interviews regarding telecommuting, Geography and Innovation

SIEMENS
Stephan Meyer
HR Strategy US Region and IT Applications for HR; Former divisional CIO for Siemens.
The opinions expressed here are not that of the firm, but are that of the named representative.

1. Could you please answer how important geography is to Siemens in respect to R&D and innovation, and in what way telecommuters may contribute to or hinder innovation of the firm? Any thoughts from your perspective on the importance of geography to the firm?
Geography is very important. In my experience telecommuting seriously impacts the effectiveness of an R&D organization, both for idea generation (creativity) and idea development. The effectiveness of an R&D organization depends not only on the know-how that is formally documented but also on the tacit know-how/experience that is shared by the teams and that is typically passed on from more senior team members to more junior ones. For this passing to work day-to-day interaction/cooperation is almost a must and this can only work well onsite.

2. What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?
In regard to full time telecommuting, I guess it is more a life-style choice. I wouldn't say that somebody chooses a career as a telecommuter. Now, telecommuting is really only an option for a limited set of careers. So in theory, somebody could make a career decision based on the fact that one option is more likely to allow for telecommuting than another, if telecommuting is an important lifestyle choice for that person.

3. What role does telecommuting play in Siemens's strategy and what does it mean for Siemens's competitive advantage?
For the overall business strategy it plays a very limited role. For what we call people strategy, it is certainly an element of "work-life-balance" that may be offered to employees in certain situations.

4. How will (does) Siemens include telecommuters in its organic growth principles and in what way is this carried out through policy?
There are policies on telecommuting for people that work from home part of the time. And there are rules for people that work from home full time. The specifics are different from division to division based on the requirements.

5. In what ways does Siemens include or try to include telecommuters in office or organizational culture?
This is the responsibility of the manager of the respective organization to ensure that telecommuters participate in the respective activities and are sufficiently integrated into the team based on the specific requirements. There is no formal approach, policy, etc. nor should there be. This is what a manager does.

6. What is the attrition rate and growth rate of telecommuters compared to traditional employees?
I don't think we are measuring this. Anecdotal evidence is that attrition rate is higher. However, that may be a function of the fact that telecommuting is often used if a person can't relocate for family reasons. The additional effort, travel and stress caused by telecommuting may lead people in these situations to look for a local job opportunity and then leave Siemens. Not sure about growth rate.

SARA LEE
George Chappelle
Chief Information Officer

1. Could you please answer how important geography is to Sara Lee in respect to R&D and innovation, and in what way telecommuters may contribute to or hinder innovation of the firm? Any thoughts from your perspective on the importance of geography to the firm?
As a food company many of our products are geography specific – for instance Jimmy Dean breakfast meals are predominantly in the southern US. As a result you need to connect to consumers in those geographies through advertising and soliciting ideas for product innovation. Certain aspects of the process lend themselves to limited telecommuting, but not a lot.

2. What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?
I think it's definitely more of a lifestyle versus career choice, particularly as you progress to higher levels in the organization.

3. What role does telecommuting play in Sara Lee's strategy and what does it mean for Sara Lee's competitive advantage?
In certain areas of our business we allow people to work from home – sales, as an example, and in certain areas of US - but it's not full time from home and you must appear in the office on a regular scheduled basis.
4. How will (does) Sara Lee include telecommuters in its organic growth principles and in what way is this carried out through policy?
Blank
5. In what ways does Sara Lee include or try to include telecommuters in office or organizational culture?
There is a regular schedule that people who work from home have that indicates when they must be in the office for meetings, events, or business updates.

6. What is the attrition rate and growth rate of telecommuters compared to traditional employees?
I'm not aware we track attrition data broken out this way.

General Motors
Mark Harasim
Senior Administrator GMNA Policy Development & Employment Relations

1.Could you please answer how important geography is to General Motors in respect to R&D and innovation, and in what way telecommuters may contribute to or hinder innovation of the firm? Any thoughts from your perspective on the importance of geography to the firm?
Let me preface my remarks by offering some background regarding telecommuting. While GM does employ the use of telecommuting, one must be mindful of the fact that the vast majority of work assignments within a manufacturing environment do not lend itself from a compatibility stand point to the telecommuting work arrangement. As I am sure you would agree, a production line supervisor is unable to effectively run a vehicle assembly line from a remote location. He/she must be on site and present to direct work activities, interface with employees and monitor product quality. However, there are a number of non-manufacturing assignments that are highly compatible. If the technology resources are in place to support a telecommuting arrangement, and the employee is deemed capable of working in a non-supervised environment, and leadership is in agreement with the arrangement, telecommuting can work extremely well. Not only does GM get the job done, but it permits employees to find a work-life balance that suits their lifestyle, and has a favorable impact upon retention of key skill sets. When all of these work variables are met and well understood by the participants involved, the "virtual office" concept essentially eliminates any geographic boundaries.

2. What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?
I view it as a generational lifestyle choice. Typically, Generation X and Y employees demand/expect this type flexibility in their work assignments. It is an expectation that they generally have coming into the job. They also have difficulty conforming to a company's policies that do not provide this type of desired flexibility. In such cases, we see issues with retention. There is also some residual resistance to telecommuting by longer service employees because (a.) they were never provided this type of flexibility in their career, either because technology was not in place to support such an arrangement, or philosophically their leadership placed significant value on face time, or (b.) those employees working offsite are viewed by their in office peers as not fully utilized and/or not subject to any of the walk-up assignments that may arise. As such, they feel they are subject to extra work, simply because they are in the office and the telecommuter is not. Agreeably so, this is an issue leadership needs to address to ensure that ALL employees are fully engaged and working productively.

3. What role does telecommuting play in General Motors's strategy and what does it mean for General Motors's competitive advantage?
I cannot state that there is a broad scale telecommuting strategy. However, we do have long-standing policies that deal with alternative work arrangements (which include telecommuting) that we make available to employees. It is something that we communicate in our recruiting efforts and recognize as an attractive incentive to prospective new hires that have desirable skills. This clearly can give GM the competitive advantage. It is also widely recognized that in a pandemic situation (outbreak of SARS or bird flu), the ability to efficiently perform work from a remote location may be key to continuing the business and minimizing further exposure of the illness to employees. Keep in mind, GM is a global entity and must be prepared to deal with such situations. GM also has a Flexible Service classification that permits employees to work on a reduced schedule --- this has also been a great work-life balance tool, particularly for working mothers that want to slowly transition their way back into the work place.

4. How will (does) General Motors include telecommuters in its organic growth (growth from within the company) principles and in what way is this carried out through policy?
We have included this information in our Employee Engagement initiatives that is rolled out to all salaried employees. This initiative communicates generational expectations, performance management and career development ---- things that are extremely important to all employees.

5. In what ways does General Motors include or try to include telecommuters in office or organizational culture?

See response to Question #4. Also, leadership has the responsibility to ensure that telecommuters are treated fairly in career development discussions and compensation planning. Clearly, technology support is key in terms of keeping these people connected and included as part of the GM team.

6. What is the attrition rate and growth rate of telecommuters compared to traditional employees? I don't have attrition figures that I can share with you. Certainly, we have experienced attrition with our younger employees. However, I would not directly attribute that to the telecommuting. Given the fact that we are a manufacturing operation, I would say that traditional work assignments far outnumber those that can be performed on a telecommuting basis. Of those that can be performed remotely, I would venture there has been an increase in telecommuting where all work considerations are deemed favorable.

DUKE ENERGY
Terri Alsop
IT Talent Management Coordinator

1. Could you please answer how important geography is to Duke Energy in respect to R&D and innovation, and in what way telecommuters may contribute to or hinder innovation of the firm? Any thoughts from your perspective on the importance of geography to the firm?
Duke Energy thinks in terms of talent management rather than innovation. If you consider innovation as a consequence of effective talent management, then I think we can answer this question. In this context, geography is important not so much as an enabler, but to avoid becoming a barrier. We believe virtual work teams are a technique that allows us to recruit and retain the best talent regardless of where the workers reside. For example, as part of our M&A strategy, we expect to grow the size of our company through mergers and acquisitions of other like companies, while operating as a single organization. This leads us to have teams and organizations that span geography. We seek to obtain and retain the best talent we can find in these various regions, forming teams that must work virtually across the geographies. Telecommuting is an important aspect of this as an extension to the virtual workplace. If we are already working virtually from company facilities, it's not any different to work from any location. Telecommuting broadens the pool of talent available.

2. What are your thoughts on telecommuting being more of a lifestyle choice compared to a career choice?
While I can imagine that some individuals would choose a career based on their ability to telecommute, it is much more of a lifestyle choice at Duke Energy. When our work-at-home program is implemented in its more permanent form, it will be seen as work/life balance option and not a career enhancer.

3. What role does telecommuting play in Duke Energy's strategy and what does it mean for Duke Energy's competitive advantage?
Telecommuting (working from home) is currently being evaluated by Duke Energy. For the IT Department, which is out front of the rest of the organization in our roll out of a work at home option, we see offering this choice as a strong retention tool and as an option which will attract potential employees.

4. How will (does) Duke Energy include telecommuters in its organic growth principles and in what way is this carried out through policy?
N/A since we are just getting into this our maturity isn't there enough to answer this one.

5. In what ways does Duke Energy include or try to include telecommuters in office or organizational culture?
In the pilot we are very intentional about training our managers to level the playing field in meetings. By this we mean, to have meetings via 'live meeting' phone conferences with all team members, not just those telecommuting. One of our VP's hasn't held a face-to-face staff meeting in months. We also will set parameters around how long a person will need to be in the office for enculturation purposes before being allowed in the work at home program. These parameters will be individual to the employee's previous experience and the complexity of the team culture.

6. What is the attrition rate and growth rate of telecommuters compared to traditional employees?
No stats on this yet.

APPENDIX C

Occupation Titles of Telecommuters

Sales/account managers/representatives/executives	49
Project managers	21
Senior/executive/middle management	22
Consultant/implementation specialist/technical	22
Systems analyst/programmer analyst	20
Software engineers	13
Product managers/specialists	12
Medical/nurses	4
Clinical specialists/solutions	4
Administrative support/trainers	4
Retail/Inventory	4
Transportation	2
Financial/accounting	3
N=	**180**

APPENDIX D

Telecommuting Survey

1. How many days a week do you telecommute?
    a. 1 day a week
    b. 2 days a week
    c. 3 days a week
    d. 4 days a week
    e. 5 days a week
    f. 6 days a week
    g. 7 days a week
    h. 1 half-day per week
    I. 2 half-days per week
    j. 3 half-days per week
    k. 4 half-days per week
    l. 5 half-days per week

2. Are you full-time or part-time (full-time is 35 or more hours per week)
    a. Full-time
    b. Part-time

3. What is the best description of your telecommuting location?
    a. Telecommute from my home
    b. Telecommute from a customer/client location
    c. Telecommute from a telecenter that is closer to my home than it is to the company's location
    d. Telecommute from a telecenter that is closer to my company's location than it is to my home
    e. Telecommute from a wireless equipped establishment (such as a bookstore, coffee house or library) that is closer to my home than it is to my company's location
    f. Telecommute from a wireless equipped establishment (such as a bookstore, coffee house or library) that is closer to my company's location than it is to my house
    g. Other (open text entry)

4. If you alter you telecommuting locations please select the amount of days per week spent working at each location. (Respondents can select one of 10 options below)

Home	1, 2,3,4,5 days or half-days per week
Telecenter/Hotelling space	1, 2,3,4,5 days or half-days per week
Wireless Establishment	1, 2,3,4,5 days or half-days per week
Client's location	1, 2,3,4,5 days or half-days per week

3. How many hours per week do you work on average Monday through Friday only?

Hours	20, 25, 35, 40, 45
Other	(Open-text entry)

If you work weekend hours, how many do you work?

a. Not applicable
b. 1-2 hours
c. 2-4 hours
d. 4-6 hours
e. 6-8 hours
f. 8-10 hours
g. Other (Open-text entry)

4. Does the nature of your job require that you work on-the-road or out of the office?

Yes
No

5. Does your company have dedicated office or desk space for you at their company location?

a. Yes, an office
b. Yes, a desk
c. Yes, shared space
d. No

6. Why do you telecommute?

a. Saves gas money
b. I like having no commute or reduced commute
c. My company supports this kind of setup
d. More time to spend with family
e. It is a more productive/efficient work environment

Other (Open-text entry)

7. How many years have you been telecommuting for this company?
   a. 1 or less
   b. 2 years
   c. 3 years
   d. 4 years
   e. 5 years
   f. 6 years
   g. 7 years
   If more than 7, please enter number of years (Open-text entry)

8. Have you moved since you have been telecommuting for this company?
   a. Yes
   b. No

9. If you did move during the time you have been telecommuting, which statement best describes the circumstance of your move?
   a. Not applicable
   b. My job requires working on the road or out of the office and I moved closer to customer locations.
   c. My job requires working on the road or out of the office and I moved further away from customer locations,
   d. I telecommute from home and moved farther away from my company's office locations.
   e. I telecommute from home and moved closer to my company's office location
   f. I telecommute from a telecenter or hoteling location and moved closer to this location.
   g. I telecommute from a telecenter or hoteling location and moved farther away from this location.
   h. I telecommute from a wireless establishment and moved closer to this location
   I. I telecommute from a wireless establishment and moved farther away from this location.

10. If you moved and telecommute from a telecenter, hoteling space or wireless establishment, was this move closer to or farther away from your company's office location?
   a. Not applicable
   b. Farther away from company location
   c. Closer to company location

11. What do you like most about telecommuting?
    a. No dress code
    b. Flexible work schedule
    c. Relaxed work environment
    d. No commute or reduced commute
    e. More efficient than working in the office
    f. Other (Open-text entry)

12. What do you like least about telecommuting?
    a. Lack of structure
    b. Feel alienated from others
    c. Not making career connections that would occur at the office
    d. Not conducive to sharing ideas or concerns about work issues.
    e. Other (Open-text entries)

13. Do you encounter technical problems at your telecommuting location?
    a. Yes
    b. No

14. What is the most frequent technical problem you have?
    a. Network problems (can't connect to servers or files; connection gets dropped)
    b. Login problems (problems with user name and password)
    c. Server problems (slow and crashes; key applications unavailable)
    d. Other (Open-text entry)

15. How much time is spent weekly dealing with technical problems that delay your work?
    a. Minutes (Open text entry)
    b. Hours (Open text entry)

16. Would you seek employment elsewhere if telecommuting were no longer available?
    a. Yes
    b. No

17. Are you happy with telecommuting?
    a. I love it!
    b. I like it.
    c. It is just average.
    d. Not that happy with it.
    e. I don't like it.

18. Would you prefer working as a traditional employee at your company's location rather than telecommuting?
    a. Yes
    b. No

19. What is your salary?
    a. Yearly $ (Open text entry)
    b. Hourly $ (open text entry)

20. How many miles is it from your primary telecommuting location to your company office location?
    a. Miles (Open text entry)
    b. Length of commute in minutes one-way (open text entry)

21. Male or Female? (select male or female)

22. Select statement that best describes your education and professional background.
    a. High School diploma
    b. Some college
    c. Professional certifications; no degree
    d. Associates degree
    e. Associates degree and professional certifications
    f. Bachelors degree
    g. Bachelors degree and professional certifications
    h. Masters degree
    I. Masters degree and professional certifications
    j. PhD, doctorate, M.D.
    k. PhD, doctorate, M.D. and professional certifications
    Other (open text entry)

23. What is your age? (open text entry)

24. What is the address of your company office or location?
    a. Street
    b. City & State
    c. zip code

25. what s your job title and function?
    a. Title (i.e. graphic designer)
    b. Function (i.e. advertising)

APPENDIX E

Traditional Employee Survey

1. If you are a traditional employee, are you able to login from home?
   a. Yes
   b. No

2. Are you full-time or par-time? (full-time is 35 or more hours per week)
   a. Full-time
   b. Part-time

3. How often do you log into the network from home?
   a. None
   b. 1 day a week
   c. 2 days a week
   d. 3 days a week
   e. 4 days a week
   f. 5 days a week
   g. 6 days a week
   h. 7 days a week

4. If you are a traditional employee but are able to telecommute some, how many days per week or month do you telecommute?
   a. None
   b. 1 half day per week
   c. 2 half days per week
   d. 3 half days per week
   e. 1 day per week
   f. 2 days per week
   g. 3 days per week
   h. 1 day per month
   I. 2 days per month
   j. 3 days per month
   k. Other (open text entry)

5. If you are able to telecommute some, what is the best description of your telecommuting location?

a. Telecommute from my home
b. Telecommute from a customer/client location
c. Telecommute from a telecenter that is closer to my home than it is to the company's location
d. Telecommute from a telecenter that is closer to my company's location than it is to my home
e. Telecommute from a wireless equipped establishment (such as a bookstore, coffee house or library) that is closer to my home than it is to my company's location
f. Telecommute from a wireless equipped establishment (such as a bookstore, coffee house or library) that is closer to my company's location than it is to my house
g. Other (open text entry)

6. In general, how much time is spent weekly dealing with technical problems that delay your work?

a. Minutes (open text entry)
b. Hours (open text entry)

7. Are you happy working as a traditional employee?

a. I love it!
b. I like it.
c. It is just average.
d. Not that happy with it.
e. I don't like it.

8. Would you rather telecommute?

a. Yes
b. No

9. For what reason would you rather telecommute?

a. Does not apple
b. No commute or reduced commute
c. More relaxed work environment
d. More efficient than working in the office
f. More family time
g. No dress code
h. Flexile work schedule
I. Other

10. For what reason would you rather telecommute?
    a. Does not apply
    b. No commute or reduced commute
    c. More relaxed work environment
    d. More efficient than working in the office
    e. More family time
    f. No dress code
    g. Flexible work schedule
    h. Other (open text entry)

11. How many miles is your commute from your home to your office/company location?
    a. Miles (open text entry)
    b. Commute in minutes – one way (open text entry)

12. Are you male or female?
    a. Female
    b. Male

13. What is your salary?
    a. Salary $ (open text entry)
    b. Hourly $ (open text entry)

14. What is your job title and function?
    A. Title (i.e. graphic designer) (open text entry)
    b. Function (i.e. advertising) (open text entry)

15. Please select statement that best describes your educational background.
    a. High School diploma
    b. Some college
    c. Professional certifications; no degree
    d. Associates degree
    e. Associates degree and professional certifications
    f. Bachelors degree
    g. Bachelors degree and professional certifications
    h. Masters degree
    I. Masters degree and professional certifications
    j. PhD, doctorate, M.D.
    k. PhD, doctorate, M.D. and professional certifications
    Other (open text entry)

16. What is your age? (open text entry)

17. How many hours do you work Monday through Friday, or during your regular work schedule?

Hours 20, 25, 35, 40, 45
Other (open text entry)

18. How many hours do you average per week working at home after your regular office hours during the week or on the weekend?

a. Not applicable
b. 1-2 hours
c. 2-4 hours
d. 4-6 hours
e. 6-8 hours
f. 8-10 hours
g. Other (open text entry)

19. Does your work outside of regular business hours and on weekends require you to login to your company's network?

a. Yes
b. No

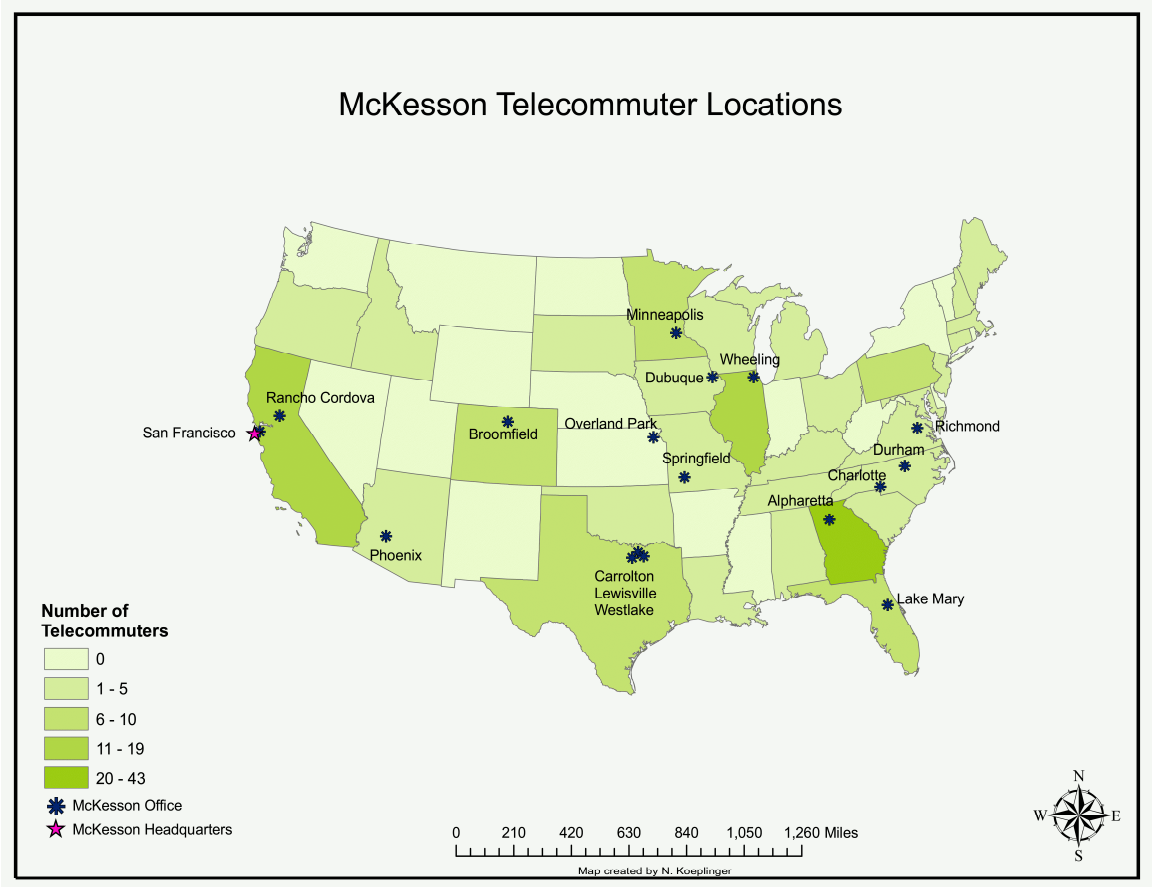
20. Have you moved since you have been working for this company?

a. Yes
b. No

21. If you did move during the time you have been working for this company, which statement best describes the circumstances of your move?

a. I moved closer to my company's location
b. I moved further away from my company's location

APPENDIX F


McKesson Telecommuter Locations
Minneapolis
Wheeling
Dubuque
Rancho Cordova
San Francisco
Broomfield
Overland Park
Springfield
Richmond
Durham
Charlotte
Alpharetta
Phoenix
Carrolton
Lewisville
Westlake
Lake Mary
Number of Telecommuters
0
1 - 5
6 - 10
11 - 19
20 - 43
McKesson Office
McKesson Headquarters
0 210 420 630 840 1,050 1,260 Miles
Map created by N. Koeplinger
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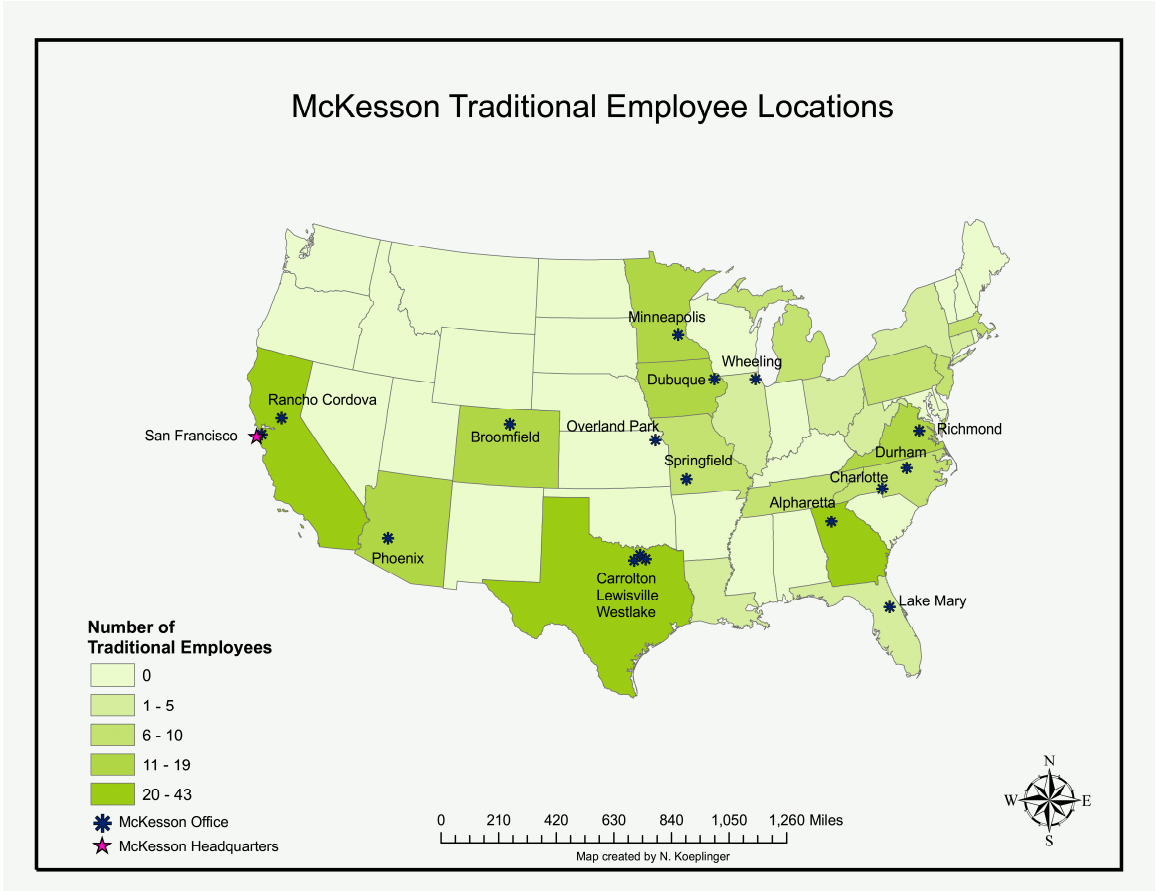
APPENDIX G


McKesson Traditional Employee Locations
Minneapolis
Wheeling
Dubuque
Rancho Cordova
San Francisco
Broomfield
Overland Park
Springfield
Richmond
Durham
Charlotte
Alpharetta
Phoenix
Carrolton
Lewisville
Westlake
Lake Mary
Number of
Traditional Employees
0
1 - 5
6 - 10
11 - 19
20 - 43
McKesson Office
McKesson Headquarters
0 210 420 630 840 1,050 1,260 Miles
Map created by N. Koeplinger
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